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EL ABADIYA 2, A NAQADA I SITE NEAR DANFIQ, UPPER EGYPT

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1. Site Situation

During the 1985 survey, the Belgian Middle Egypt Prehistoric Project of Leuven University discovered several Palaeolithic sites in the Naqada area, Upper Egypt. One was the site of El Abadiya, near Danfiq (Fig. 1: 1), and several excavation campaigns were organised for excavating that Upper Palaeolithic site, which we now call El Abadiya 1 (Vermeersch *et al.* 2000). A new field campaign took place from February 18 to March 25, 2001. In the 2001 campaign, we intended to continue the exploration of the Upper Palaeolithic of the region, but the survey of the area led to the discovery of El Abadiya 2, which was identified as a Predynastic site, whereas El Abadiya 3 proved to be a late Palaeolithic site, probably Isnan. It was apparent that the El Abadiya 2 site would be destroyed very soon, as a large area of its surface had already been stripped and lowered in preparation for irrigation. We therefore decided to test the site and evaluate its potentiality for further research, eventually by another research group. Time restrictions did not allow us to conduct an extensive excavation of the whole site. The data collected during that survey-excavation are presented in this contribution.

2. Field Work

El Abadiya 2 is located some hundreds of metres south of El Abadiya 1 (Fig. 1), just north of the Meri Girgis monastery, near Abu Diyab Shark, Danfiq, Upper Egypt. The site is situated on a small terrace remnant of local fluviatile origin, east of the paved desert road between Taramsa and Gurnah (Fig. 3). Bulldozers had partially levelled the area, and at the time of its discovery, about 40 to 50 cm of the prehistoric deposits from the North Sector of the site had already been removed. Part of the South Sector deposits was still entirely preserved.

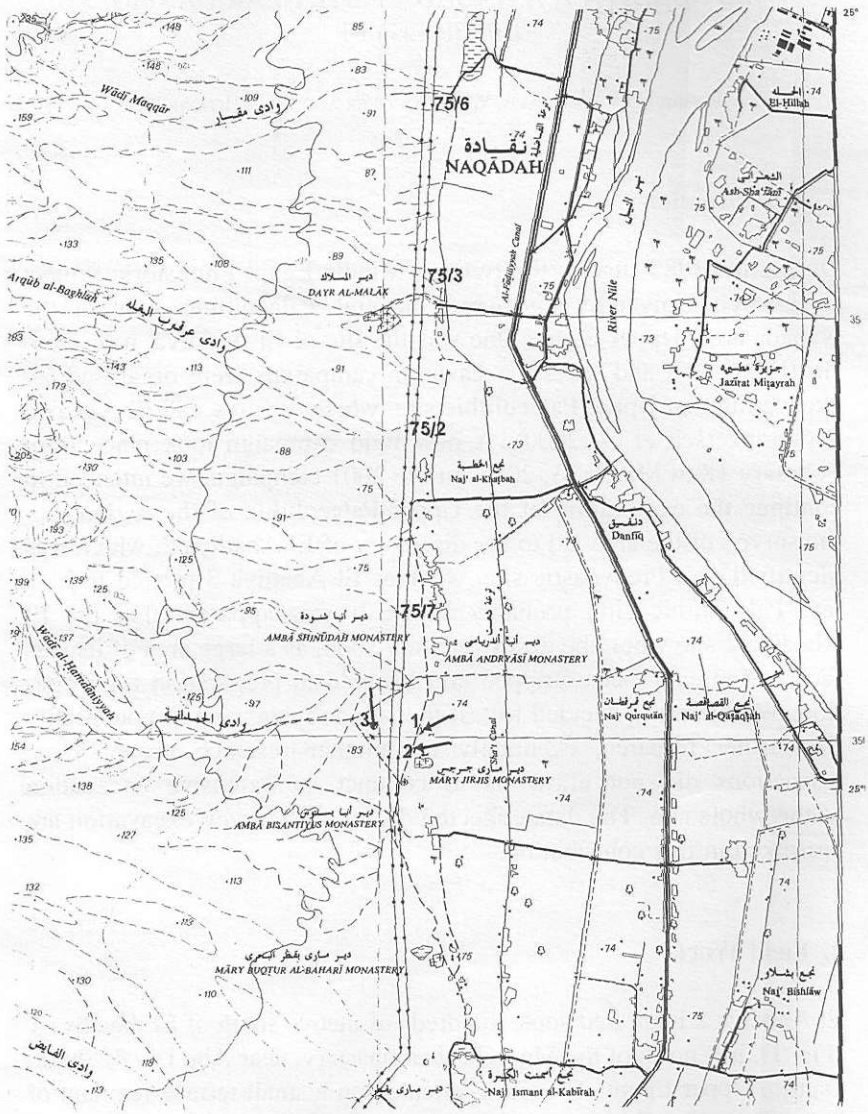


Fig. 1. Map with the sites El Abadiya 1, 2 and 3 and the approximate location of the Predynastic Khattara sites discovered by Hays (1984)

Fig. 2. General view from the preserved part of El Abadiya 2 looking toward the destroyed area, where the darker area corresponds to the site's extent

A topographic plan (Fig. 3) indicating the position of the three sites was constructed using the base line that initially was established at the Shuwikhatian site of El Abadiya 1 (Vermeersch *et al.* 2000). A detailed plan of the terrace mapped the original extent of the Predynastic occupational surface, which was still visible on the surface by its darker colour, which has been revealed by the levelling of the area (Fig. 4). A local base line (20N10E – 20N30.16E) was established in the field. Within the grid system (in metres) of the El Abadiya 1 site, point 20N10E is equal to 359.570S, 25.868E, 82.696 m a.s.l. elevation and point 20N30.16E to 361.713S, 45.855E, 82.091 m a.s.l. elevation.

Two test areas were excavated. In the South Sector, an excavation area of about 12 m^2 was situated in 12-17N21-23E on the preserved part of the site, where the deposits, visible in the profile created by the bulldozer, were the thickest. In the North Sector, an area again of about 12 m^2 was situated in 41-43N30-32E in the levelled area, where we hoped to discover the lower-most deposits of the site. An additional test

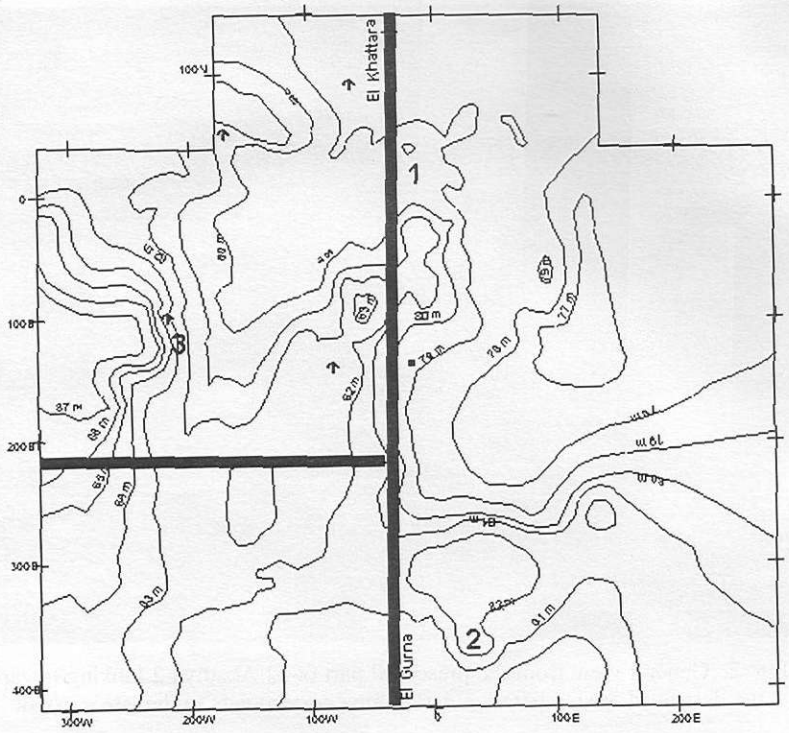


Fig. 3. General map of the El Abadiya area with the position of the Predynastic site (El Abadiya 2), the paved roads and the power pylones (↑)

area on the preserved portion of the site (12-14N4-5E) was cleared, but its excavation was restricted to the upper centimetres.

The purpose of our excavation was clearly not the understanding of the settlement structure and spatial pattern. An excavation of only 24 m^2 on a site that covers at least 1200 m^2, cannot disclose such data. Instead, we attempted to determine if some diachronic differentiation would be visible in the 50 cm thick archaeological deposits. Could a chronologically relevant evolution in the recovered material, lithic or ceramic, be observed? It was therefore decided to undertake the excavation in successive excavation spits.

Excavation proceeded by troweling in spits about 5 to 10 cm thick within surface units of 1.5 m^2, except in 16-17N21-23E in the South Sector where the material was collected as a single unit because the 17N area was very restricted (Fig. 8). Artefacts were not tridimensionally

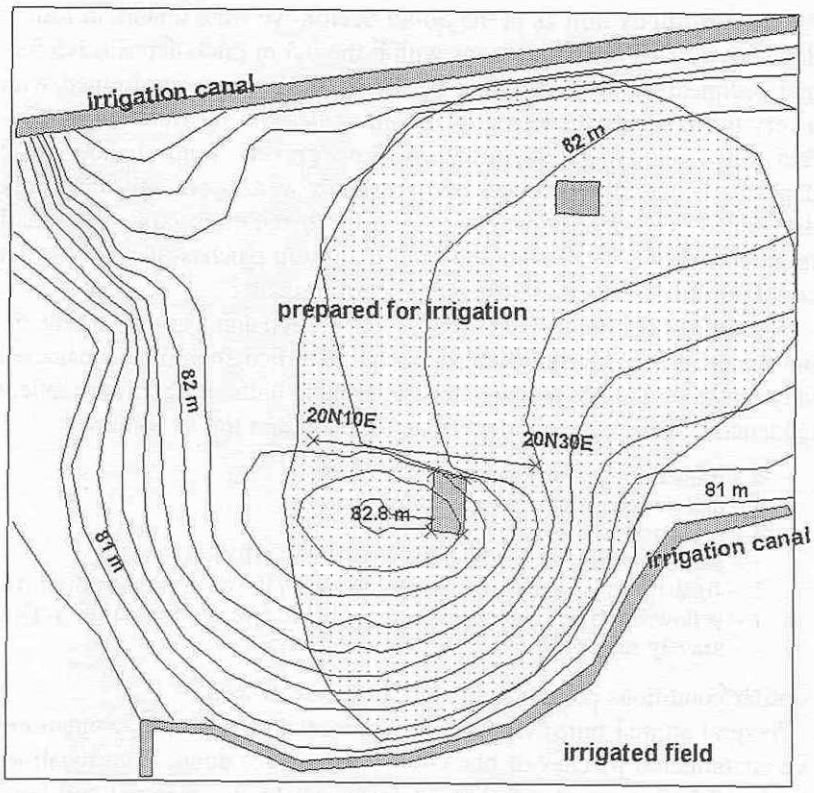


Fig. 4. Topographic plan of El Abadiya 2 with the two excavated areas, the grid base line and the extent of the site (shaded) indicated

plotted, because we preferred to proceed more rapidly in order to excavate as extensive an area as possible, as we feared that the archaeological surface would soon disappear under irrigated fields. All excavated deposits were screened through a 4 mm mesh screen.

3. Stratigraphy

The surface of the preserved area is characterised by the presence of numerous limestone fragments, often burnt, in a matrix of organically rich gravely sand. The limestone fragments are clearly manuports. Their high concentration is the result of aeolian erosion of the fine Predynastic deposits. Below the surface, limestone fragments occurred with less frequency. Sherds and flints are well represented on the surface.

In the North as well as in the South Sector, we were unable to follow distinctive stratigraphic horizons within the 0.5 m thick deposit. No formal sedimentary layering could be detected. We were confronted with a very loose, heterogeneous grey to yellow deposit, in which burnt rubified silty sand was mixed with yellow gravely sand. Inside those deposits, bones, flint artefacts and potsherds were apparently randomly distributed. The deposit was very rich in charcoal, as large and small fragments and ashes, which appeared mainly in patches that most often could not be described as structured hearth remains.

A profile of our South Sector (Fig. 8) excavation unit was drawn (Fig. 5), but the different "layers" that have been identified should be considered very tentative and not as separate stratigraphic units. Rather, they reflect tendencies, which we can identify as follows from top to bottom:

6 – brownish grey silty sand (5YR 6/1)
5 – dull yellowish brown sand (10YR 5/4)
4 – brownish grey ashy silty sand (10YR 5/1)
3 – yellowish brown slightly gravely silty sand (10YR 5/6)
2 – light brownish grey slightly silty sand (5YR 7/1), very rich in gravel
1 – yellowish brown gravely silty sand (10YR 5/6), resting on the yellow gravely sand deposits (2.5Y 8/6) of the terrace.

Similar conditions prevail in the North Sector as well.

Several animal burrow holes were present in the profile. Sometimes we encountered patches of blackish (ovicaprine?) dung. Both localities produced high amounts of flint artefacts, potsherds, charcoal and bone (in a poor state of preservation). The deposits as a whole are considered as the refuse (*i.e.*, midden) from human occupation. The gravely sand matrix originates from the terrace deposits, which have been mixed with Nilotic silt from the floodplain and with animal and human refuse remains. Thin lamina of greyish white ashes (N 8/0) can be found throughout the profile.

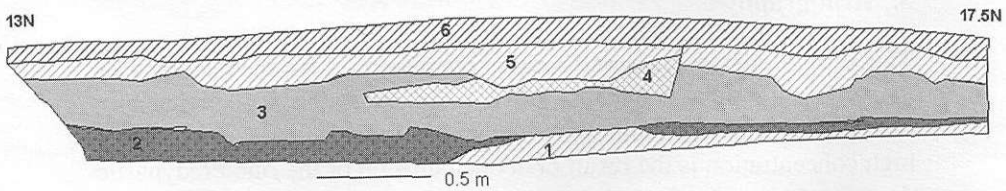


Fig. 5. Profile 13-17N21E

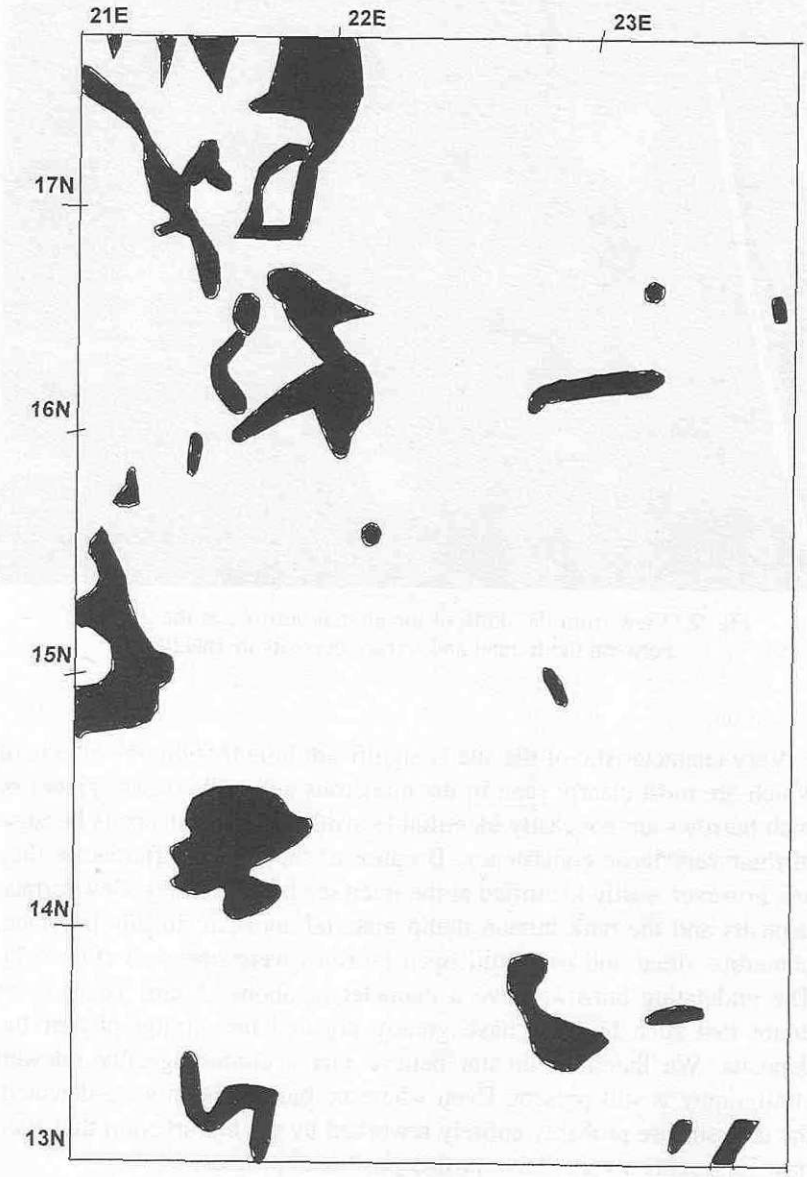


Fig. 6. Animal burrows (in black) at the interface between the yellow terrace and the dark Predynastic deposits

Fig. 7. View from the north of the animal burrows at the interface between the human and terrace deposits in 16N20E

Very characteristic of the site is significant bioturbation, the effects of which are most clearly seen in the numerous animal burrows. Traces of such burrows are not easily identifiable inside the black deposits because of their very loose consistency. Because of the colour differences, they are, however, easily identified at the interface between the yellow terrace deposits and the dark human dump material above it. In this interface, numerous filled and even still open burrows were observed (Fig. 6-7). The undulating burrows have a diameter of about 15 cm. There is no doubt that such burrows have greatly affected the stratigraphy of the deposits. We therefore do not believe that a chronologically relevant stratigraphy is still present. Even where no bioturbations were detected, the deposits are probably entirely reworked by the bioturbation that even now represents a very active post-depositional process.

Such post-depositional bioturbation is clearly attested by the presence of a a piece of woolen textile in 13N22E at an elevation of 82.42 m, thus 20 cm below surface, which, when excavating, we interpreted as being *in situ*. Indeed, during the very careful recovery of this textile, no

characteristic traces of intrusive activity were observed. After dating, however, it is clear that the textile is intrusive. A ^{14}C-date of 255 ± 25 BP (KIA-14005), representing the 16th-17th century cal AD, leaves no doubt about its origin. No other intrusive material was identified. Nevertheless, we have to take into account the possibility that the stratigraphic succession is not relevant chronologically.

4. Structures

4.1. Structures from the South Sector

The horizontal and vertical distribution of the flint artefacts in the South Sector is apparently random; at least we were unable to identify a specific structure in its distribution. As can be seen in Fig. 9, flint artefact

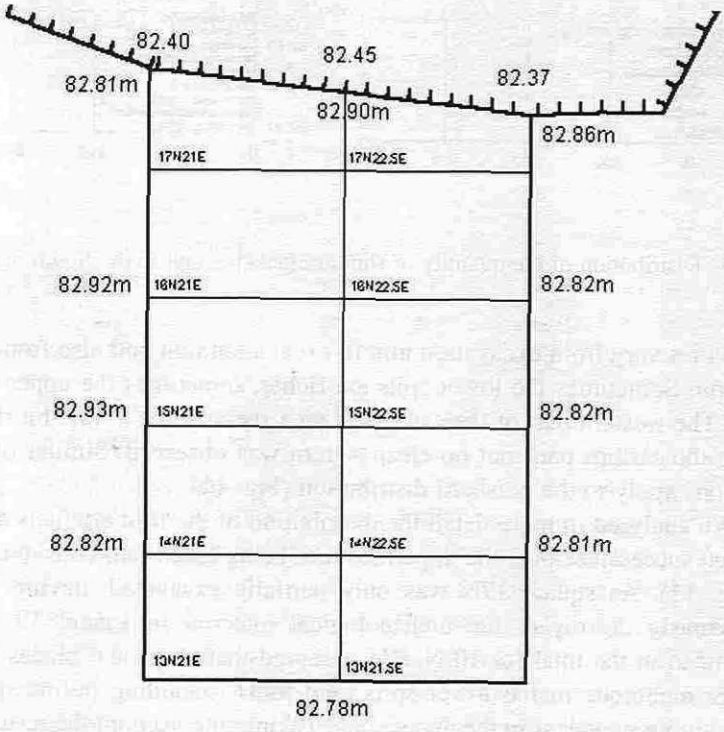


Fig. 8. El Abadiya 2 South Sector, excavation trench at the north edge of the destroyed area

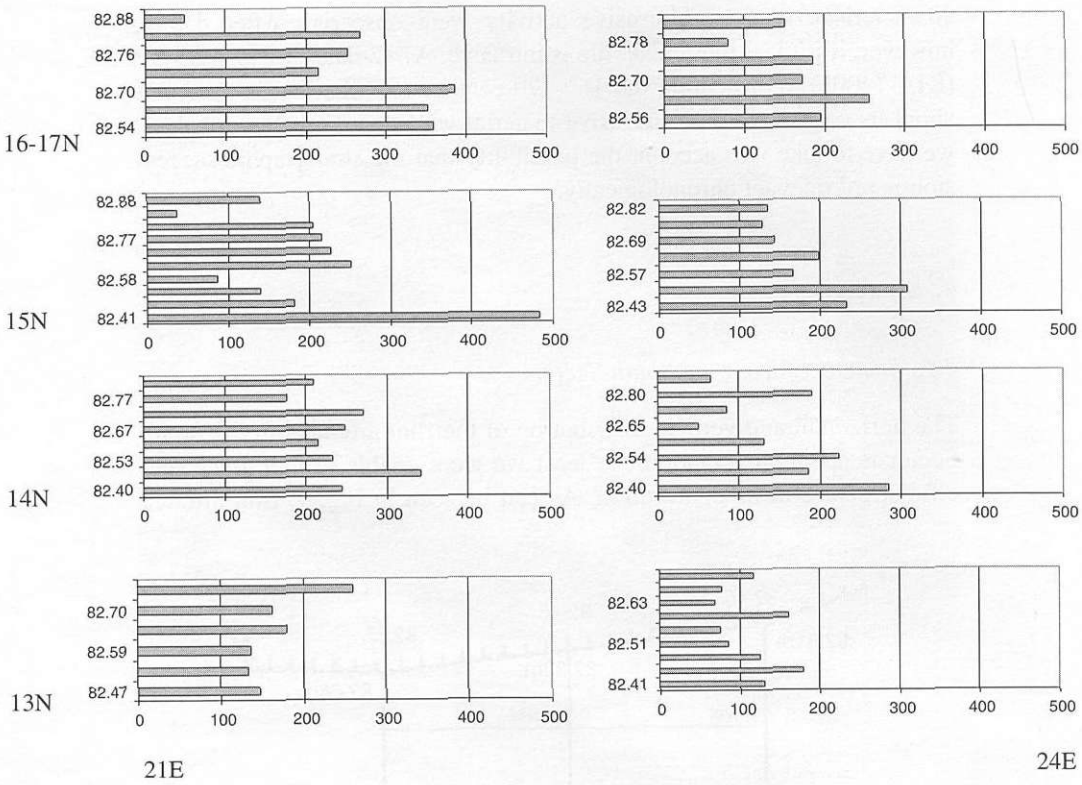


Fig. 9. Distribution of the quantity of flint artefacts per spit in the South Sector

densities vary from excavation unit to excavation unit and also from spit to spit. Sometimes the lower spits are richer, sometimes the upper ones are. The western part of the excavated area seems to be a little bit richer than the eastern part, but no clear pattern was observed. Similar observations apply to the potsherd distribution (Fig. 10).

We analysed in more detail the distribution of the flint artefacts of six to ten successive spits, the uppermost not being taken into consideration (Fig. 11). As square 17N was only partially excavated, having been previously destroyed, the archaeological material in square 17 N is included in the total for 16 N. We observed that chips and blades were more numerous in the lower spits, and tools (including burins spalls) were more prevalent in the upper spits. Taking into account the restricted excavated area, we are unable to present an interpretation for these distribution patterns.

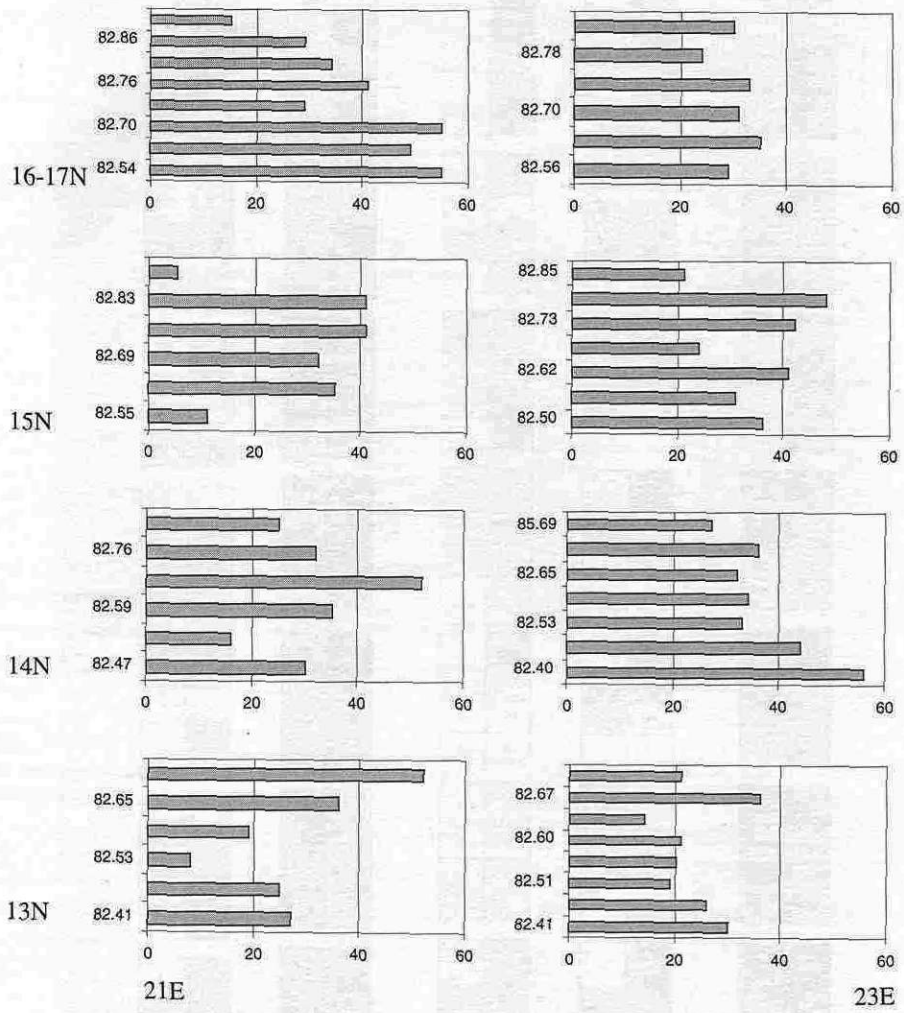


Fig. 10. Distribution of the number of ceramic sherds per spit in the South Sector

A hearth, apparently *in situ*, was found in square 15-16N21E at a depth of 82.68 m a.s.l. It is an oval accumulation (60 x 40 cm) of grey ashes and large pieces of charcoal in a shallow, 6 cm deep depression.

Throughout the deposits numerous limestone fragments, mostly burnt, were encountered. They are interpreted as scattered hearth stones. Charcoal is present all over in large quantities and often in large pieces.

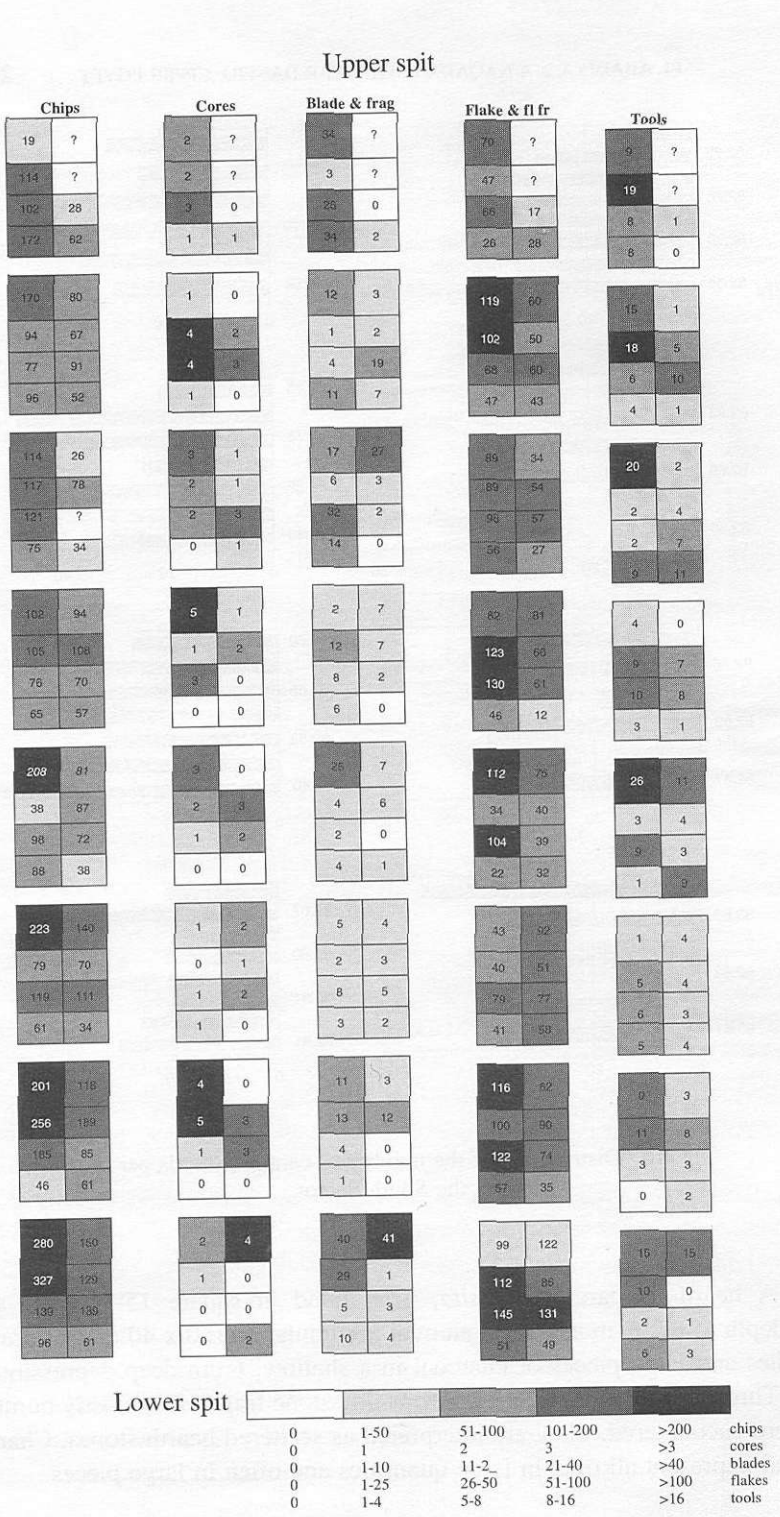


Fig. 11. Flint artefact distribution according to debitage categories

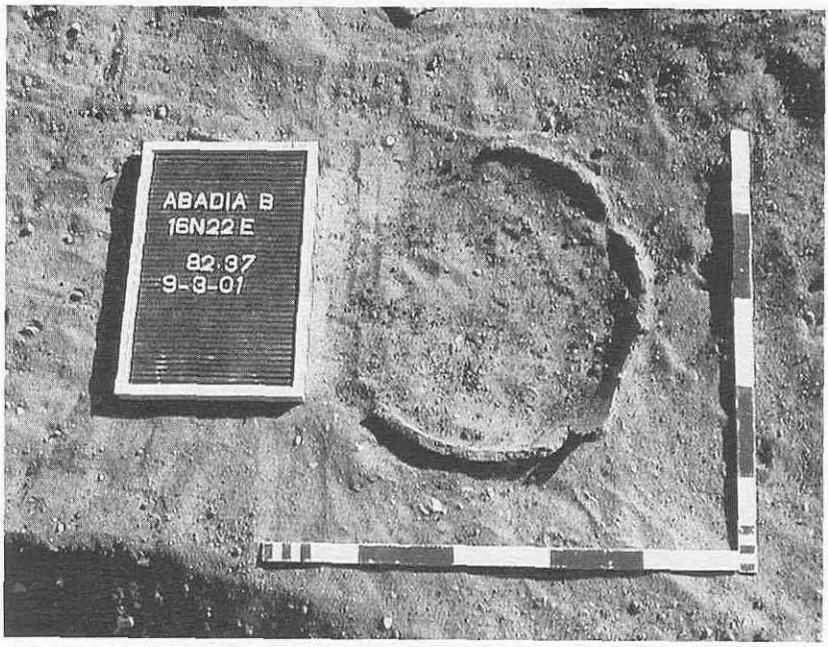


Fig. 12. Pot embedded in the terrace deposits below the Predynastic deposits

At the bottom of the anthropogenic deposits in 16N22E, the base of a large rough pot (Fig. 12) was embedded in the upper 10 cm of the terrace deposits down to 82.39 m. This suggests that the basal spits may be related to a living area, the other structures of which remain buried.

4.2. Structures from the North Sector (Fig. 13)

Sediments in the North Sector (Fig. 14) are similar to those from the South Sector, with patches of charcoal and no specific structure. The origin of the deposits, being mainly human, seems to be similar to that in the South Sector. Here, however, an unknown amount of the upper Predynastic deposits have been lost by levelling in preparation for the irrigation project. The vertical distribution of flint artefacts (Fig. 16) and ceramics (Fig. 17) seems to be entirely random, with sometimes more artefacts in the upper levels, and sometimes less.

At the base of the Predynastic deposits in 45N31-32E, a hearth structure was present. It consisted of a circle of burnt stones with a significant concentration of charcoal inside it (Fig. 15). In 44-45N30E, a shallow (6 cm) pit had been dug into the terrace deposits.

46N - 44.5				
44.5 - 43N				
	30E	31E	32E	33E

Fig. 13. Excavation units at El Abadiya 2 North

Fig. 14. View from the northeast of the North Sector

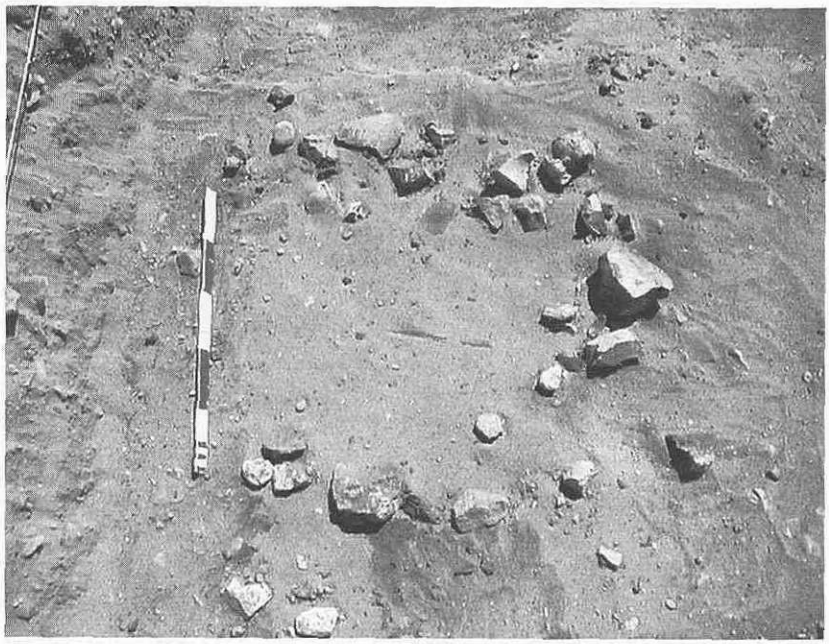


Fig. 15. Hearth on top of the terrace deposits in 45N31-32E

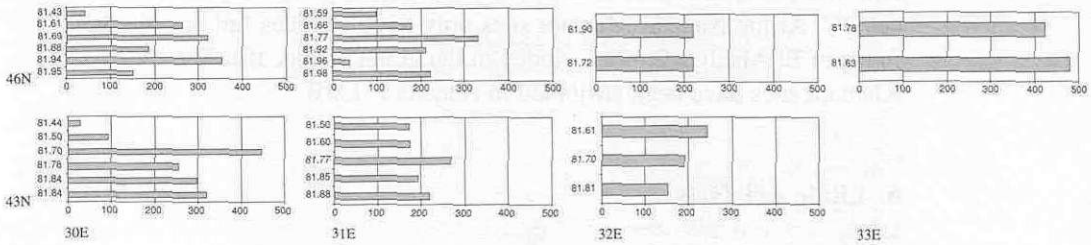


Fig. 16. Northern sector flint artefact distribution with the number of fragments per 1.5 m²

5. Absolute Chronology

Spikelet forks of *Triticum turgidum* ssp *dicoccum* from El Abadiya 2, South Sector, at a depth of 5 cm provide an AMS date of 5080 ± 45 BP (GrA-20142), which is calibrated with 2σ as 3980-3770 cal BC. Seeds of *Triticum turgidum* ssp *dicoccum* and *Hordeum vulgare*, and spikelet forks of *Triticum turgidum* ssp *dicoccum* from El Abadiya 2, North

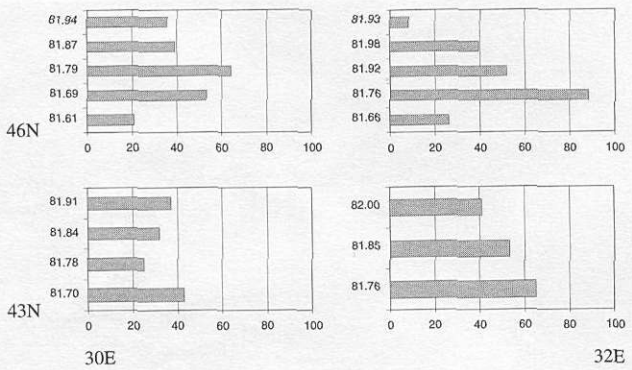


Fig. 17. Northern sector ceramic distribution with the number of sherds per 1.5 m^2

Sector, recovered at a depth of 45 cm provide a date of 4910 ± 45 BP (GrA-20144), which is calibrated with 2σ as 3790-3630 cal BC. We may conclude from these data that the deposits were deposited rather rapidly during a period of just a few centuries.

The ^{14}C-dates from our site and those from the different Naqada Khattara sites (Hassan 1984c; 1985) cluster in the time period of 3700 to 3800 cal BC. At the Naqada Khattara sites only three samples fall outside the range of El Abadiya 2 (not included in the graph of Fig. 18). The Naqada Khattara sites have been attributed to Naqada I-IIA/B.

6. Lithic Artefacts

6.1. Lithic artefacts from the South Sector (Figs. 19-22)

The raw material is a typical Egyptian fine-grained brown-beige flint. Cobbles of such flint quality are present in the numerous terrace deposits of the area.

Flaking (Table 1) proceeded by a hard hammer technique in an opportunistic approach using local flint cobbles. Cores are mainly irregular (Table 2) and mostly entirely exhausted. Single platform cores, ninety-degree (Fig. 19.1) and discoid cores are represented. Double platform cores (Fig. 19.3) are rare. Some cores with two posterior crests have been used for blade production. Still, blade production is restricted

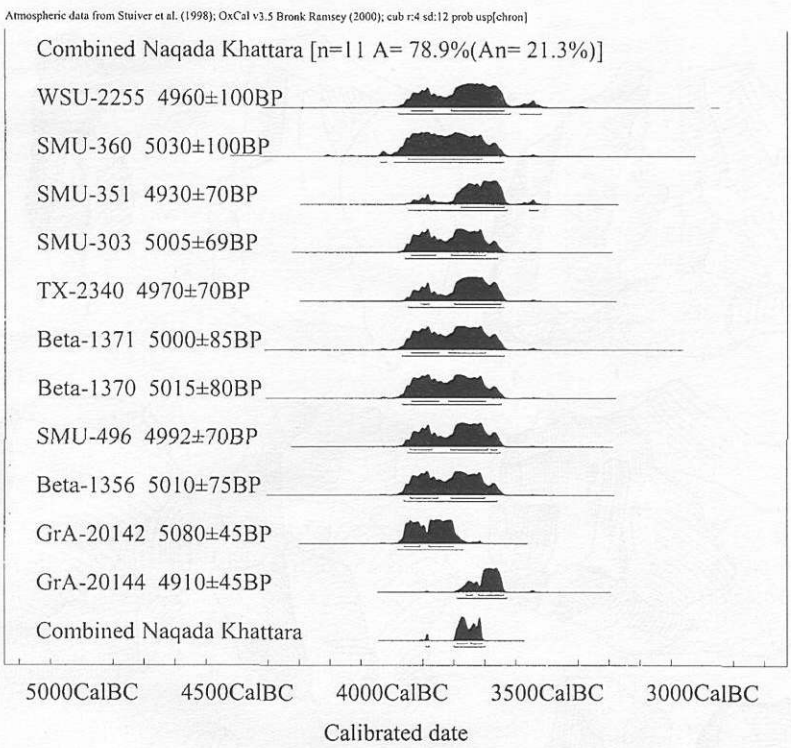


Fig. 18. Combined probabilities of the ^{14}C dates from the Naqada Khattara sites and those from El Abadiya 2

(Table 1). Real blades with parallel edges are rare. The longest do not exceed 8 cm. A single intrusive Levallois core was found.

Elongated flakes (Figs. 19.5; 22.1,9) are the blanks that have been produced most often on the site. Their edges are convex or concave. Elongated flakes have an average length of about 6 cm. The butt is generally plain; sometimes it is facetted. The transverse section of elongated flakes is most often trapezoidal.

Flakes are thin, and they have most often a plain butt. Some are the result of bifacial flaking and display the typical curved proximal-distal section. The high number of cortical flakes, core rejuvenations and chips suggests an important local flaking activity. Burnt pieces are numerous and relate to the high number of charcoal fragments.

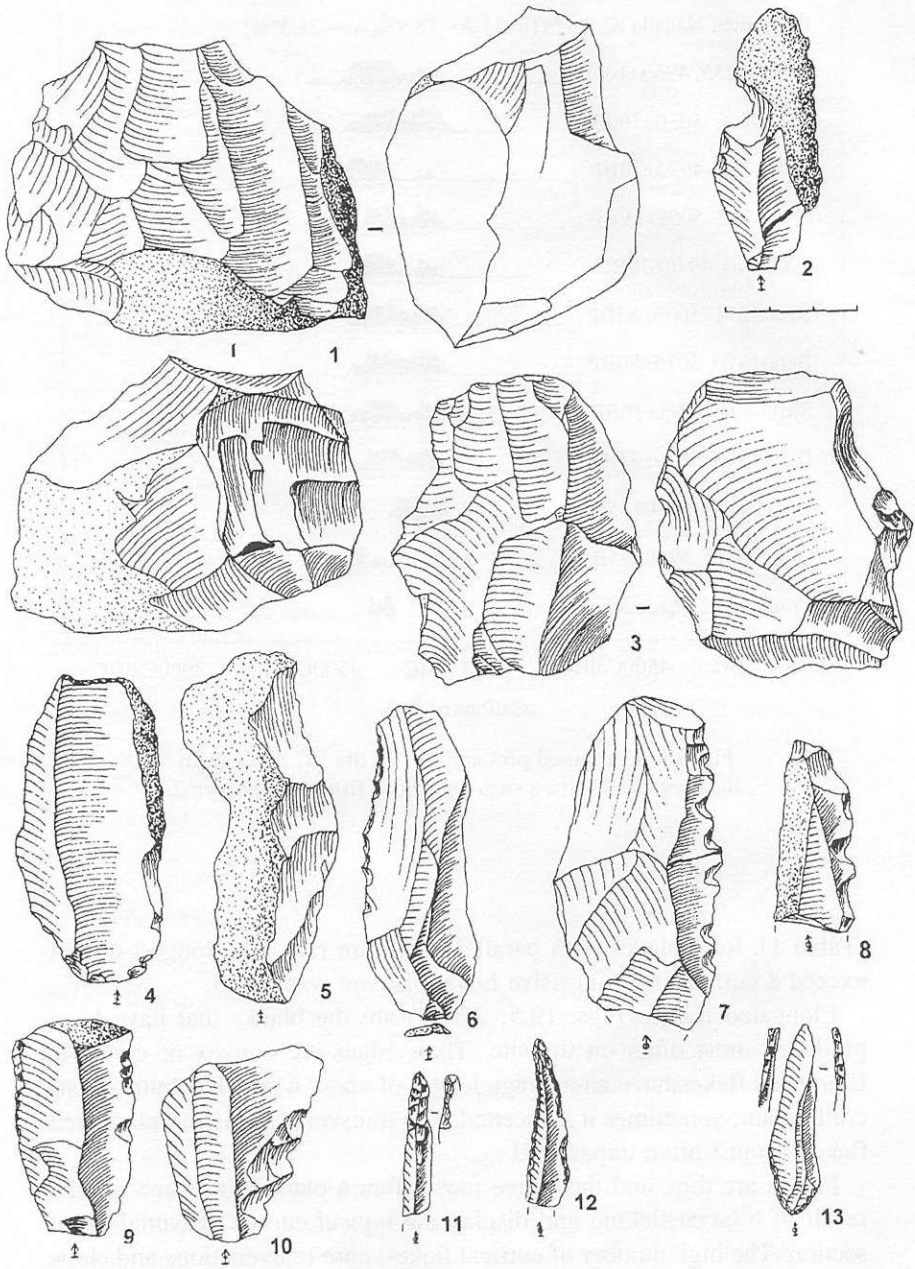


Fig. 19. Artefacts from El Abadiya 2 South

	South	North
Core	133	52
Core rejuvenation	22	15
Crested flake	7	3
Cortical flake	509	43
Chip	6924	3359
Flake	3063	1318
Flake fragment	1282	1431
Elongated flake	454	58
Elongated flake fragment	293	64
Burin spall	196	91
Axe rejuvenation flake	31	13
Chunk	77	19
Quartz flake	2	0
Burnt piece	730	373
Tools	317	211
Total	14040	7350

Table 1. Debitage from El Abadiya 2 South and North

Core type	South	North
Single platform core	14	15
Double platform core	3	1
Ninety degree platform core	9	9
Discoidal	6	10
Levallois	0	1
Irregular	101	16
Total	133	52

Table 2. Core types from El Abadiya 2 South and North

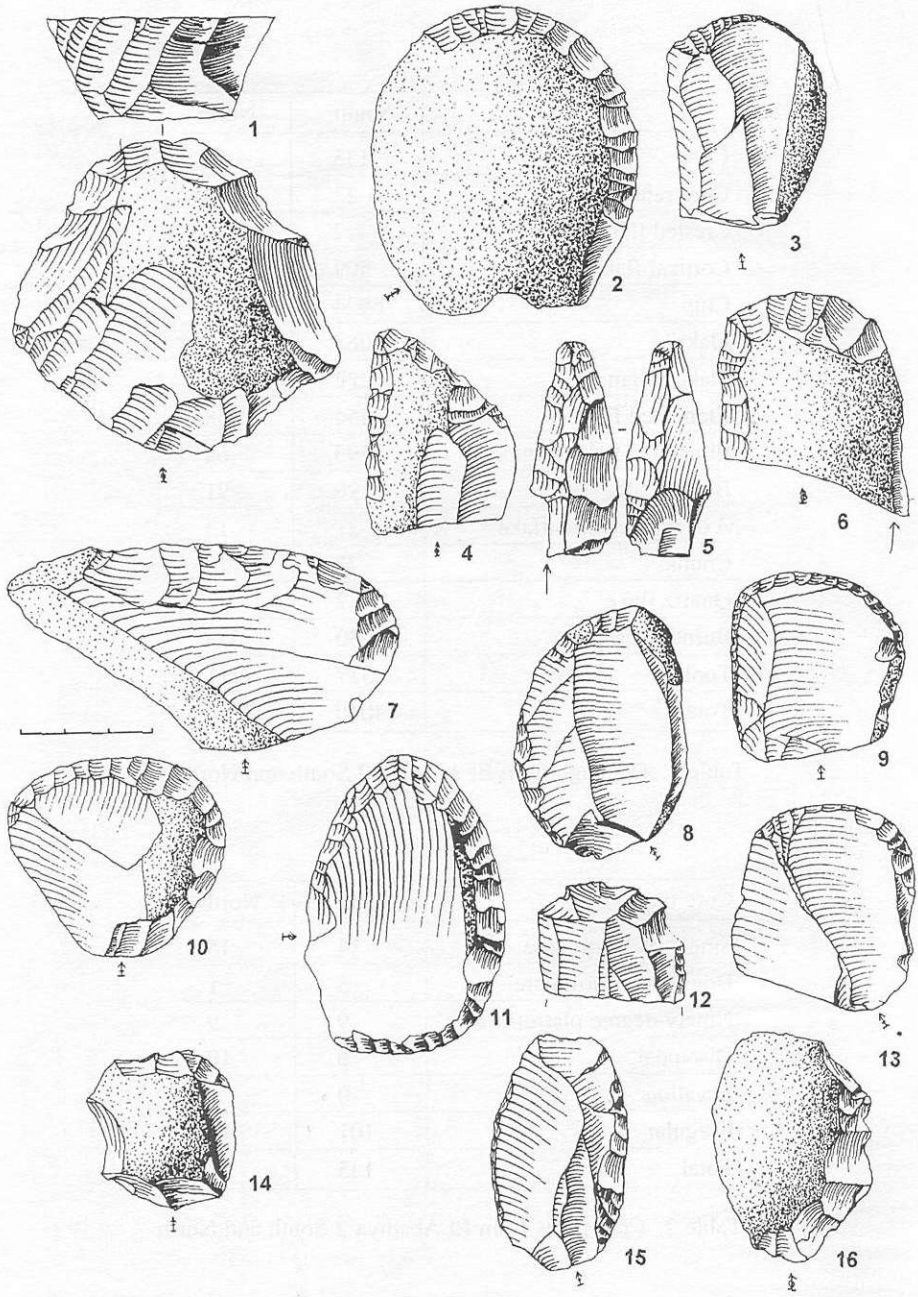


Fig. 20. Tools from El Abadiya 2 South

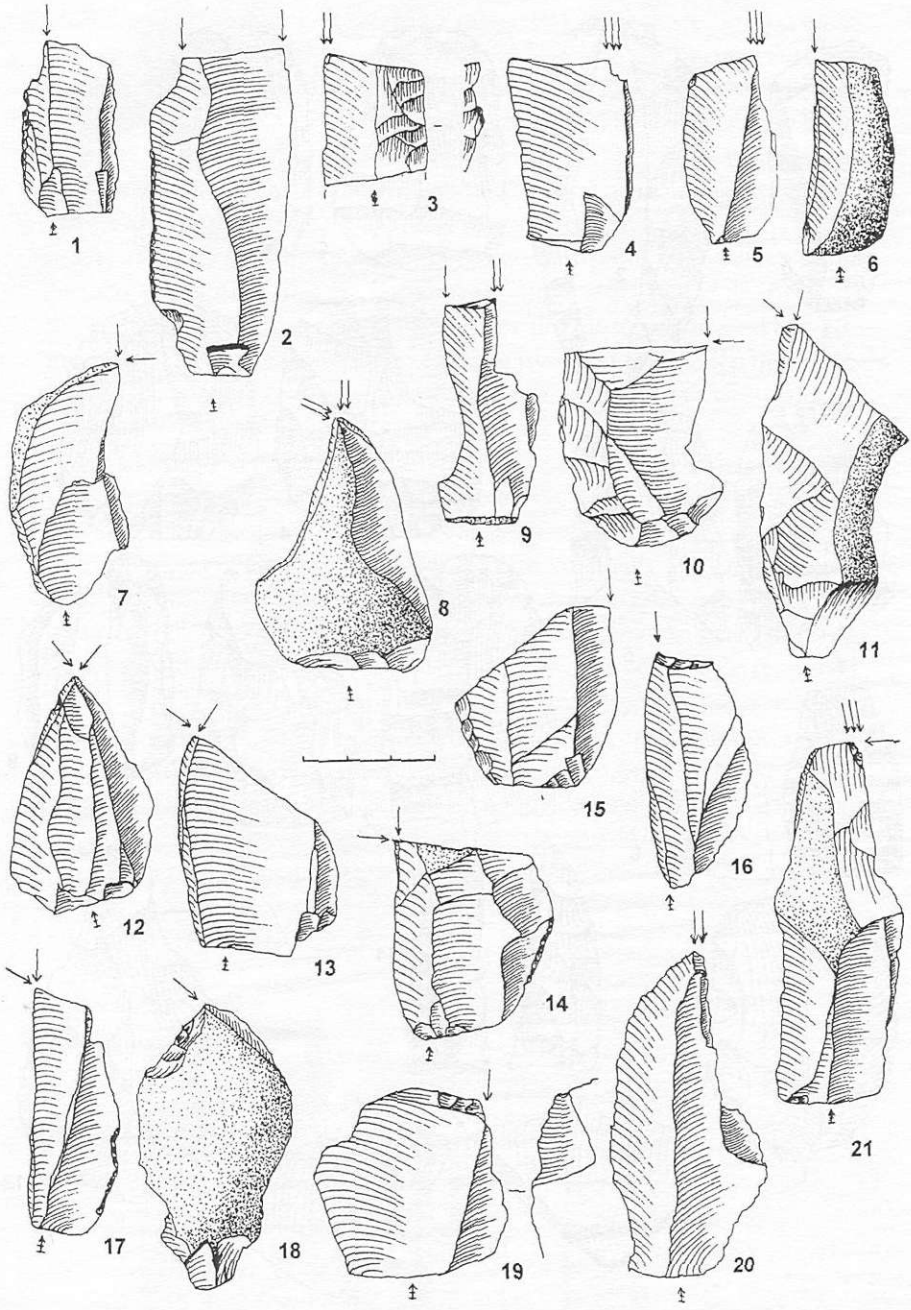


Fig. 21. Tools from El Abadiya 2 South

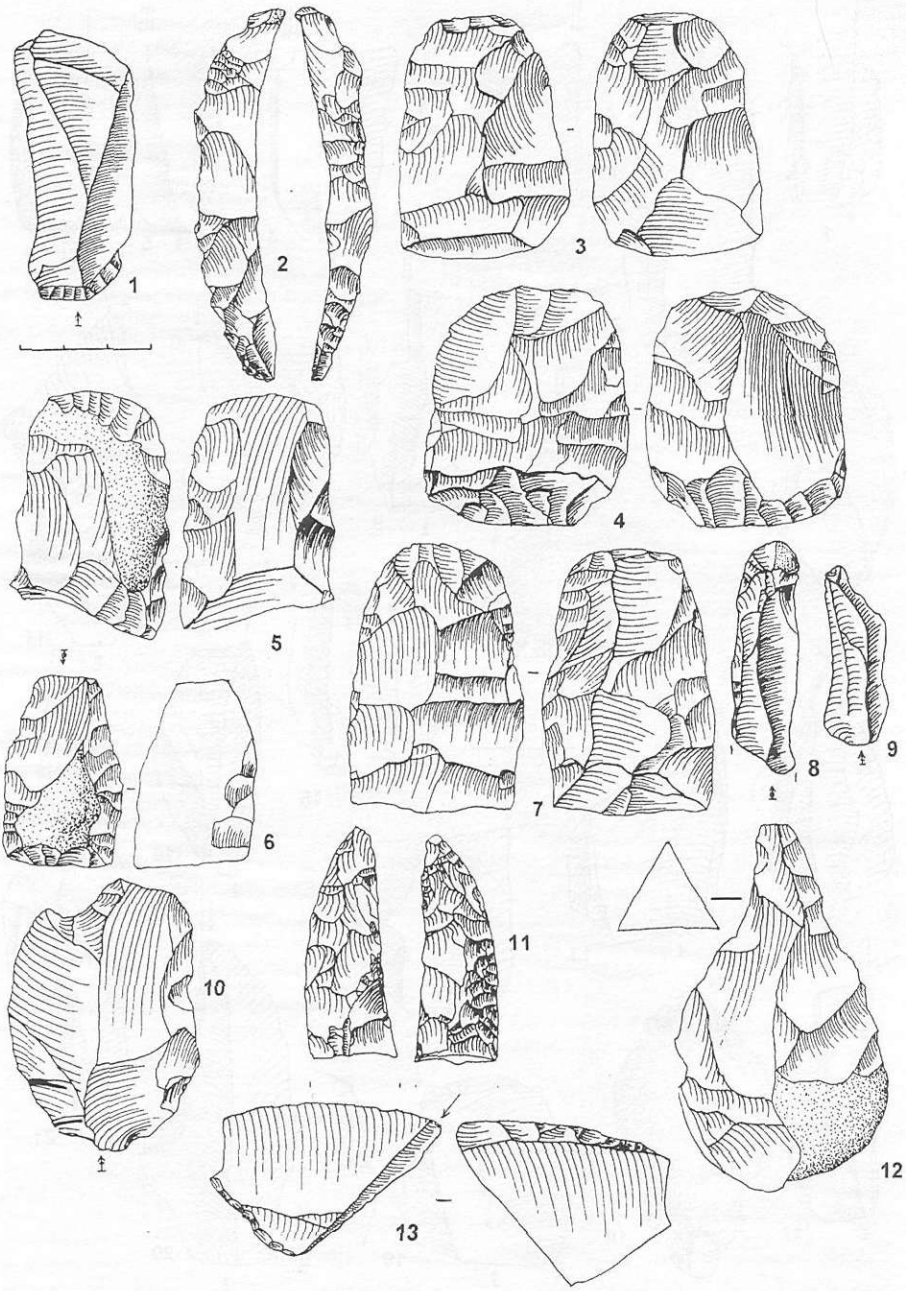


Fig. 22. Tools from El Abadiya 2 South

Altogether 317 tools have been registered from these limited excavations (Table 3). The most characteristic tools are burins. Dihedral burins (Fig. 21.7,8,10-14,17,21) are the most numerous. They are mostly *déjeté*, but also central or lateral. The burins on a break (Fig. 21.1-6,15) and burins on truncation (Fig. 21.16,18-19) are well represented. Double (Fig. 21.9) and multiple burins are present. The burins are carefully made, and their importance can be evaluated by the nearly two hundred burin spalls that were collected over such a small surface, suggesting that the burins were often resharpened and used on the spot. The average length (Fig. 23) of the burin spall (30.04 ± 4.38 mm) gives an idea of the resharpening activity. The presence of numerous long burin spalls suggests that the initial burin length was probably between 5 and 6 cm.

Most characteristic among the scrapers is a series of end-scrapers (8) with a flat retouched scraping head (Fig. 20.3,8,9,11,13). All of them are in a pink flint of fine quality. Retouches are very regular and are nicely spread over the scraper head. The flat retouch often continues on one of the two scraper edges. The scraper length is between 3 and 6 cm. Seven other end-scrapers (Fig. 20.2,10) have a nicely worked scraping head on which the retouches are semi-abrupt to rarely abrupt. Two are only partly retouched. The scraper length is between 2 and 4 cm, exceptionally 6 cm. Three end-scrapers have a retouched edge, mainly semi-abrupt. The edges of a single double end-scraper on a thick flake have been obtained by an abrupt retouch. Sometimes the scraper head is slightly denticulated (Fig. 20.12,14). A pointed side-scraper (Fig. 20.4) is fragmentary. A double end-scraper (Fig. 20.1) is made on a thick cortical blank.

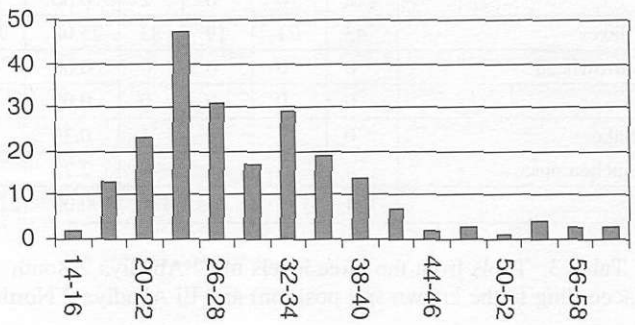


Fig. 23. Length distribution of the burin spalls in mm

Tooltype	South					North	
	Upper	Middle	Lower	All	%		%
End-scraper on a flake	8	2	1	10	3.02	3	1.4
End-scraper with flat retouch	7	1	0	9	2.72	0	0.0
End-scraper on a retouched flake	2	1	0	3	0.91	2	0.9
Denticulated end-scraper	2	0	0	3	0.91	1	0.5
Double end-scraper	1	0	0	1	0.30	0	0.0
Bifacial end-scraper	0	1	1	2	0.60	0	0.0
Predynastic transverse scraper	1	0	0	1	0.30	0	0.0
Side-scraper	0	0	1	2	0.60	0	0.0
Pointed side-scraper	1	0	0	1	0.30	0	0.0
Dihedral burin	21	14	5	40	12.08	13	6.0
Burin on a break	12	8	5	25	7.55	10	4.7
Burin on a truncation	12	2	6	20	6.04	12	5.6
Burin plan	3	1	2	6	1.81	1	0.5
Corbiac burin	0	0	1	1	0.30	1	0.5
Double burin on a break	4	0	2	6	1.81	3	1.4
Double burin on truncation / break	0	0	1	1	0.30	2	0.9
Double burin on break/end-scraper	4	0	0	4	1.21	0	0.0
Truncation	1	0	0	1	0.30	0	0.0
Borer	7	3	2	13	3.93	5	2.3
Axe	17	8	8	34	10.27	12	5.6
Notched piece	5	4	4	17	5.14	5	2.3
Denticulated piece	12	5	5	19	5.74	8	3.7
Retouched elongated flake	6	3	2	11	3.32	17	7.9
Retouched elongated flake fragment	3	0	3	6	1.81	22	10.2
Sickle	2	0	0	2	0.60	0	0.0
Retouched flakes	43	21	19	83	25.08	91	42.3
Transverse arrowhead	0	0	0	0	0.00	1	0.5
Lunate	0	0	0	0	0.00	1	0.5
Side blow flake	0	1	0	1	0.30	0	0.0
Bifacial retouched piece	-	-	-	9	2.72	5	2.3
Total tools	174	75	68	331	100.00	215	100.0

Table 3. Tools from the three levels of El Abadiya 2 South (according to the known spit position) and El Abadiya 2 North

Combination tools are present. They combine an end-scraper with a denticulate or an end-scraper with a burin (Fig. 20.6). Among the burins, two are on a break; another is a "*burin plan*" from the scraper head. Perforators (Fig. 19.11-13) are present, but are not standardised.

Notched pieces (Figs. 19.2; 22.10) have the notch most often on the distal end of the flake and have generally retouched edges. Denticulated pieces (Figs. 19.7,10; 20.16) sometimes have a real blade as blank. They are rather irregularly denticulated.

Axes (Fig. 22.3-7) are among the most characteristic tools of the assemblage. Most axes are bifacial, and many display the typical tranchet scar on the cutting edge. They have been made on thick flakes by a bifacial retouch, but in such a way that it is still possible to identify the ventral surface of the flake blank. Six axes are monofacial with some few bifacial retouches. Axes are typically 6 cm long, 4.2 cm wide and 1.9 cm thick (Fig. 24). Axe preparation flakes (Fig. 22.2) are numerous (n = 31). They have a length between 7.8 cm and 4 cm.

A tool fragment, reworked into a burin on truncation, was originally a side blow flake (Fig. 22.1). Retouched flakes and blades have most often a fine regular retouch (Figs. 19.6; 22.8). Truncated pieces are rare (Fig. 19.4). Bifacial pieces do not present specific forms, but are characterised by a mostly flat bifacial retouch (sickle) that is carefully applied (Fig. 22.11). A broken item was reused as a burin on a break (Fig. 20.5). Another of those bifacial pieces (Fig. 22.12) resembles the Badarian picks. Most bifacial pieces are probably roughouts.

When applying a χ-square test to the characteristic tools categories (scrapers, burins, axes and notched pieces), it appears that there is on the 0.01 level of significance no difference between the tool content of the upper spits and the lower spits.

A small 5 mm thick rectangular schist (siltstone) palette (Fig. 25) was found. It was obtained by bifacial flaking. Both sides are intensely polished. A fragment of another 1 cm thick palette is made from brown sandstone. Its central surface remained rough and pitted, but near the edges a stain of red-brown ochre still adhered to the surface (Fig. 26). Its other surface had not been used and retained the traces of a flat retouch. A milling stone (Fig. 27) in light brown sandstone has a slightly concave polished surface.

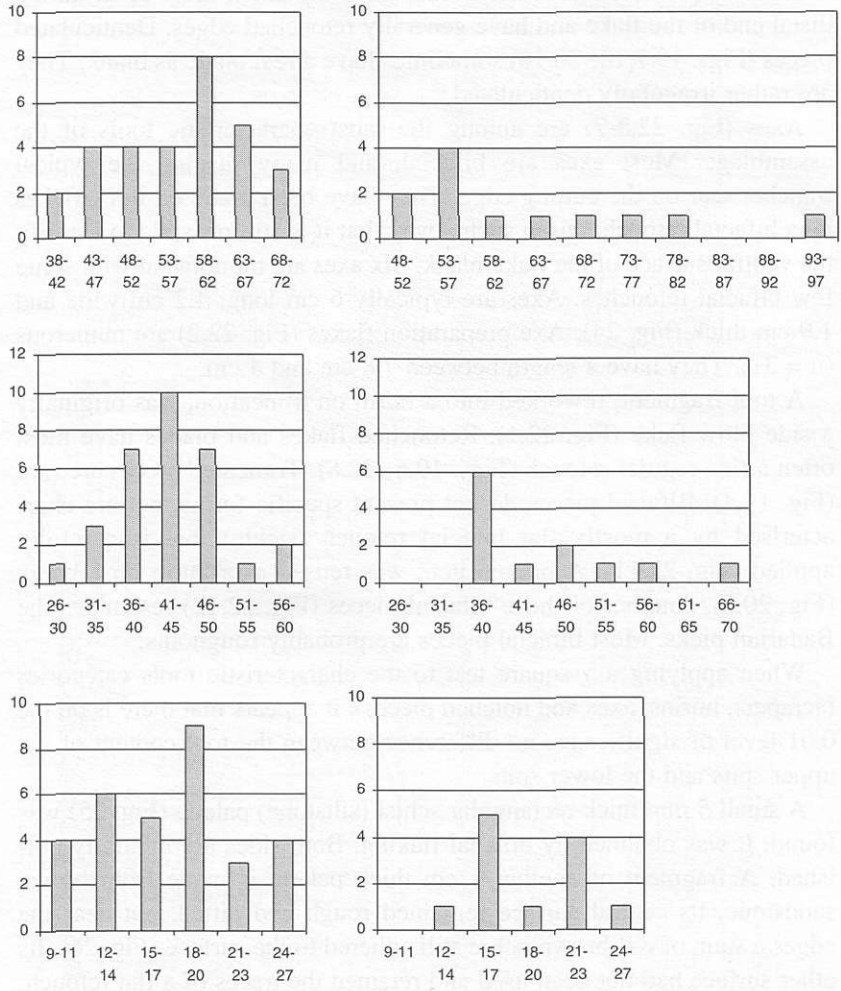


Fig. 24. Length (top), width and thickness of the axes in mm

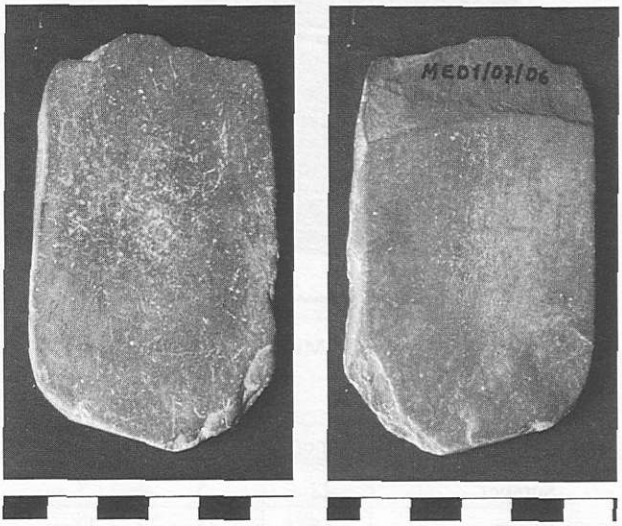


Fig. 25. Palette

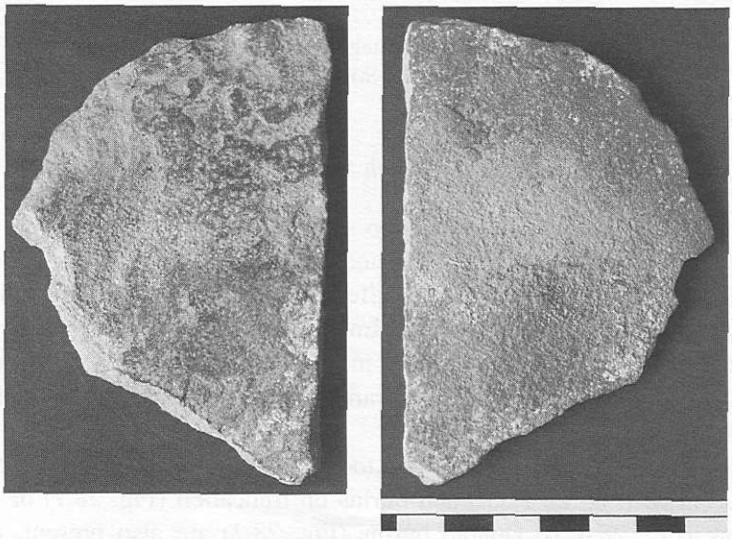


Fig. 26. Fragment of ochre stained palette

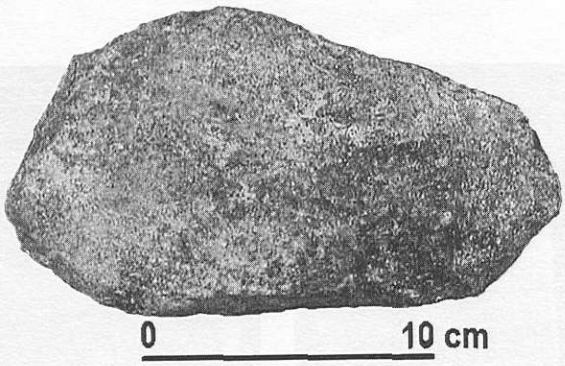


Fig. 27. Milling stone

Tool type	Upper	Middle	Lower
Scraper	22	5	3
Burin	56	25	22
Axe	17	8	8
Notched piece	5	4	4
Total tools	100	42	37

Table 4. Characteristic tool categories according to spit position from the South Sector

6.2. Lithic artefacts from the North Sector

As in the South Sector, there is no standardisation of the debitage present. The artefacts are very fresh and are made out of fine flint, similar to those of the South Sector. No differences in the debitage approach are observed (Tables 1-2). Cores are small and entirely used. Irregular and single platform cores predominate in the assemblage. They are intended for flake production. Blades are rare and not standardised; most have a plain butt.

Burins are the best represented tools (Table 3). They comprise dihedral burins (Fig. 28.1,3,8) and burins on truncation (Fig. 28.7) or on a break (Fig. 28.4-5). Double burins (Fig. 28.2) are also present. Endscrapers (Fig. 28.9-11) are less numerous than at El Abadiya 2 South. Axes are present as well, but they are thicker than those from El Abadiya 2 South (Fig. 24). Axe preparation flakes (Fig. 28.6), typical of

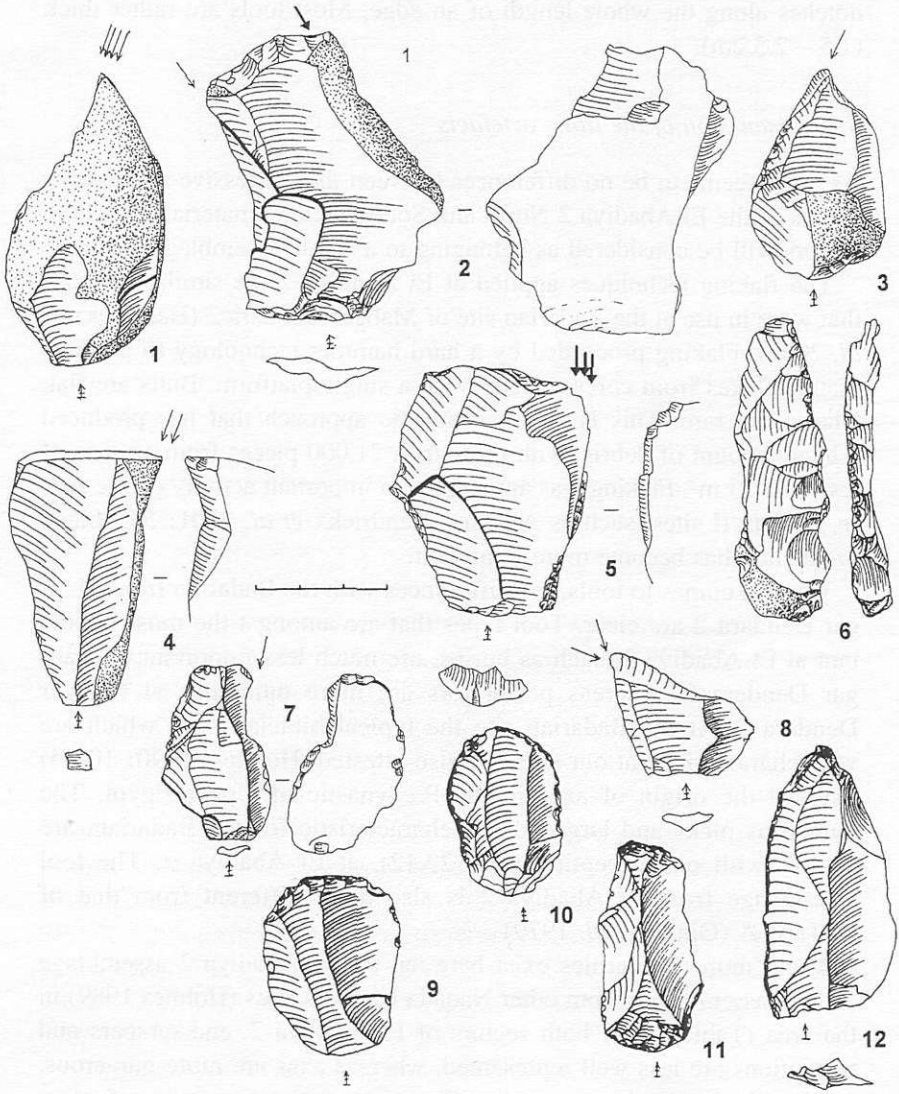


Fig. 28. Lithic artefacts from El Abadiya 2 North

bifacial flaking, are present. Bifacial retouched pieces seem to be rough-outs. They have been obtained by a flat covering retouch. Retouched flakes are numerous. Two denticulates are saw-like with very regular notches along the whole length of an edge. Most tools are rather thick (1.5 – 2.5 cm).

6.3. Discussion of the lithic artefacts

As there seems to be no differences between the successive spit assemblages of the El Abadiya 2 North and South Sectors, material from both sectors will be considered as belonging to a single assemblage.

The flaking techniques applied at El Abadiya 2 are similar to those that were in use at the Badarian site of Mahgar Dendara 2 (Hendrickx *et al.* 2001). Flaking proceeded by a hard hammer technology to produce mainly flakes from cores, mostly with a single platform. Butts are flat. Blades are rare. This is an opportunistic approach that has produced a huge amount of debris, with more than 21,000 pieces from an area of less than 23 m^2. Flaking was apparently an important activity on the site. In Naqada II sites, such as Adaïma (Hendrickx *et al.* 2001: 55), blade production has become more important.

When it comes to tools, the differences with the Badarian from Mahgar Dendara 2 are clear. Tool types that are amongst the most important at El Abadiya 2, such as burins, are much less important at Mahgar Dendera 2, whereas perforators are more numerous at Mahgar Dendera 2. At the Badarian site the typical bifacial axes, which are very characteristic at our site, are also attested. Holmes (1990: 10-14) stressed the origin of axes in the Predynastic of Upper Egypt. The numerous picks and large borers, characteristic for the Badarian, are absent, with one exception (Fig. 22.12), at El Abadiya 2. The tool assemblage from El Abadiya 2 is also quite different from that of El-Tarif A (Ginter *et al.* 1979).

Many more similarities exist between the El Abadiya 2 assemblage and the assemblages from other Naqada Khattara sites (Holmes 1989) in the area (Table 7). At both sectors of El Abadiya 2, end-scrapers and truncations are less well represented, whereas axes are more numerous. At Naqada, "the only noticeable differences are the appearance of a few regular blades and tools made on regular blades in the late Naqada sites" (Holmes 1989: 200). Such tools are lacking at El Abadiya 2, which we interpret as an indication of a rather early temporal position within the Naqada period. Differences are minor, and the composition of the

	Mahgar	KH3B	KH3 x/xi	KH4	KH7	South Town	Adaïma c>d	Abadiya 2 S	Abadiya 2 N
	%	%	%	%	%	%	%	%	%
End-scrapers	5.8	16.5	15.5	15.7	17.0	16.4	8.0	8.8	2.3
Side-scrapers	0.2	0.0	0.5	2.2	0.0	0.0	1.0	0.6	0.0
Planes	0.0	0.5	1.5	2.8	0.0	0.0	0.0	0.0	0.0
Burins	0.2	29.4	27.5	42.1	46.0	26.0	28.0	31.1	19.3
Perforators	23.8	2.6	2.7	3.4	6.0	2.8	12.0	3.0	2.3
Grand perçoirs	2.0	0.0	0.7	1.1	0.0	0.0	0.0	2.7	0.0
Truncations	0.3	2.6	3.9	3.9	2.0	2.3	2.0	0.3	0.0
Backed pieces	0.1	0.5	0.0	0.0	0.0	1.7	1.0	0.0	0.0
Notches	5.8	13.4	11.3	11.8	8.0	11.9	7.0	5.1	2.3
Denticulates	22.6	3.6	2.9	0.6	2.0	4.0	8.0	5.7	3.7
Retouched pieces	12.6	22.7	20.6	6.7	13.0	27.1	20.0	27.5	59.7
Scaled pieces	0.0	0.0	1.7	0.0	0.0	0.0	2.0	0.0	0.0
Sickles	0.0	0.5	0.0	0.0	0.0	3.4	0.0	0.6	0.0
Axes	3.1	3.6	5.9	6.2	2.0	0.0	0.0	10.3	5.6
Bifacial retouched pieces	2.1	0.0	0.0	0.0	0.0	0.0	0.0	2.7	2.3
Miscellaneous	21.4	2.1	4.7	0.6	0.0	1.1	11.0	1.6	2.5
Total number of tools	1266	194	407	178	48	177	121	331	215

Table 7. Tool class frequencies for various Upper Egyptian sites (KH = Khattara) (Holmes 1989; Hendrickx *et al.* 2001)

assemblages suggests that all sites belong to similar typo-chronological groups. Such a conclusion is in accordance with the ^{14}C-dates from our sites and those from the various Naqada Khattara sites, where only three samples fall outside the range of El Abadiya 2 (not included in the graph of Fig. 18). Taking into account all the data, we provisionally attribute the site to an early phase of the Naqada culture, most probably the early Naqada I period.

When compared to Adaïma *passées* c and >d, (Midant-Reynes & Buchez 2002: 334-335), the most obvious distinction between the two sites is the absence of axes and the importance of perforators at Adaïma.

A side blow flake, similar to the one from the South Sector, was collected at Makhadma 4 (Vermeersch *et al.* 1992: 171). They are rare in Upper Egypt. D.L. Holmes (1989) did not record them during her study

of the Predynastic lithic industries of Upper Egypt. Baumgartel (1960: 42) mentioned only one piece, which was excavated by H. de Morgan in a Naqada II grave at Zawaideh (near Naqada). Side blow flakes are, however, known from the Fayum (Caton-Thompson & Gardner 1934: 21), from Kharga Oasis (Caton-Thompson 1952: 178) and from the Late Neolithic occupation horizons at site E-75-8 at Nabta Playa (Banks 1984: 175). At Nabta Playa, side blow flake technology is considered a diagnostic characteristic of the Late Neolithic. It is associated with a date of 5810 ± 80 BP (cal BC 4690). The 800-year-later example from El Abadiya 2 suggests that the side blow flake could be an import or a piece of imported technology from the Eastern Sahara.

7. Pottery

7.1. Introduction

The ceramic material from El Abadiya 2 consists of 2543 sherds, the large majority of which are body sherds.[1] Compared to the lithic material, pottery represents only a minor part of the finds, the lithic material being almost ten times more numerous. On Naqada settlement sites, the opposite is normally observed (*e.g.*, Midant-Reynes & Buchez 2002), pottery being far more frequent than lithic material. A situation similar to that at El Abadiya 2 is, however, present at the Badarian site of Mahgar Dendera 2 (Hendrickx *et al.* 2001).

None of the vessels were intact, and there are no archaeologically complete profiles. The high degree of fragmentation may be due to the settlement type. Only a representative sample of the material, consisting of 175 characteristic pieces (123 rim fragments, 51 base fragments, 1 fragment of a perforated disc), has been studied in detail.

Because the study of the lithic artefacts had already shown that there are no temporal differences between the successive spits in the North and South sectors at El Abadiya 2, the pottery material is dealt with as a whole. For the same reason, no distribution study has been carried out.

[1] The material was examined on site by Tuur Van Hove. The present study is based on his notes, and the author [S.H.] has not seen the material himself.

7.2. Pottery groups

The material is very homogeneous. All of the pottery is made from Nile silt, occasionally with organic temper; marl clay pottery is completely absent.

For practical reasons, it has not been possible to investigate the ceramics fabrics in detail, and therefore only a distinction between three broad groups can be made, based on the ceramic material, firing technique and surface treatment. Because surface treatment and firing technique are taken into consideration, these groups cannot be considered "fabrics" as defined in the "Vienna System" by Nordström & Bourriau (1993) or the Hierakonpolis fabric classification (Friedman 1994). It is possible that the groups defined here consist in reality of more than one fabric, and this seems almost certainly to be the case for the Rough group.

* Black-topped. Untempered (?) Nile silt considered equivalent to Nile A (Nordström & Bourriau 1993: 170-171) and Hierakonpolis Fabric/temper class 2 (Friedman 1994: 138-140). All of the Black-topped pottery appears to have been polished and slipped, although this can not be confirmed beyond doubt because of the often poor preservation of the surface of the sherds. In many cases, diagonal polishing has been observed (Fig. 29), a treatment which has been considered characteristic for the Naqada region (Payne 1993: 30; Friedman 1994: 189-190).
* Red-polished. Untempered (?) Nile silt considered to be equivalent to Nile A (Nordström & Bourriau 1993: 170-171) and Hierakonpolis Fabric/temper class 2 (Friedman 1994: 138-140). As in the Black-topped pottery group, the surface always seems to have been polished and slipped.
* Rough. This group is not homogeneous, and in the field no distinction was made between sherds with organic temper or tempered with crushed potsherds (grog) alone or in combination with organic temper. Both groups are certainly present, but their relative frequency cannot at present be established. The coarse organic tempered Nile silt is to be considered as Nile B2/C (Nordström & Bourriau 1993: 171-174) and Hierakonpolis Fabric/temper class 1 and/or 26 (Friedman 1994: 142-145), although the fabric with very fine organic temper, Hierakonpolis Fabric/temper class 26 (Friedman 1994: 148-149), may also be present at El Abadiya 2. The crushed pottery tempered Fabric/temper class 7 (Friedman 1994: 150-151) and crushed pottery and organic tempered

Fig. 29. Black-topped ware with diagonal polishing (ME 01-11-09)

Fabric/temper class 27 (Friedman 1994: 151-152) are both present, but their frequencies have not been established. Crushed pottery tempered ceramics have been identified by Friedman (1994: 475) almost exclusively in the Khattara sites of the Naqada region, and it is therefore not surprising that it is represented also at El Abadiya 2. However, sherds with crushed pottery temper have also been observed along the desert routes to the west of the Naqada region by D. Darnell (pers. com.)
The surface colour of the sherds of the Rough pottery group varies from red to grey and black and significant colour variation can be observed on a single sherd. This colour variation must largely be due to firing stains, which occur frequently on organic tempered Predynastic pottery that was fired in a simple bonfire kiln. In addition there are sherds from cooking pots, which have been blackened with soot by repeated heating, but this is not always easily distinguished from firing stains on sherds.

From the total amount of sherds, the relative importance of the three pottery groups (Table 8) can only be defined approximately, and the relative proportion of Black-topped and Red-polished is especially difficult to determine. The distinction between these two groups depends entirely on the surface treatment, but as we are dealing with very fragmentary

	all sherds		rim sherds	
Pottery group	number	%	number	%
Black-topped	536	21.1	36	29.3
Red-polished	837	32.9	26	21.1
Rough	1170	46.0	61	49.6
total	2543	100.0	123	100.0

Table 8. Quantification of the pottery groups

Pottery group	number	%	%
Black-topped	4	7.8	
Red-polished	29	56.9	64.7
Rough	18	35.3	35.3
total	51	100.0	100.0

Table 9. Fabric distribution of the base sherds of the study collection

material, it is obvious that an unknown number of red coloured body sherds that originate from Black-topped vessels will be included in the Red-polished group. This is clear from the proportion of rim sherds in each of the pottery groups in the study collection (Table 8), where the Black-topped rims are more numerous than those in Red-polished. The Rough group makes up nearly half of the material regardless of whether one counts all the sherds or only the rims.

7.3. Rims and bases

Most remarkable is the complete absence of lip-rims. Narrow necks belonging to bottles and jars are also not found among the material. These observations are related, as it is mainly the Black-topped and Red-polished bottles and jars, as known from the Petrie typology, that have lip-rims.

When analysing the base fragments (Fig. 30), the Black-topped group must be considered together with the Red-polished because only in very exceptional cases, such as shallow plates, does the black part of the vessel continue down to the base. Within the study collection, 51 base fragments were identified (Table 9), providing a ratio of almost 1:2.5 to the rim fragments. The relatively low number of base fragments, a common feature on settlement sites, can be explained by the fact that many base

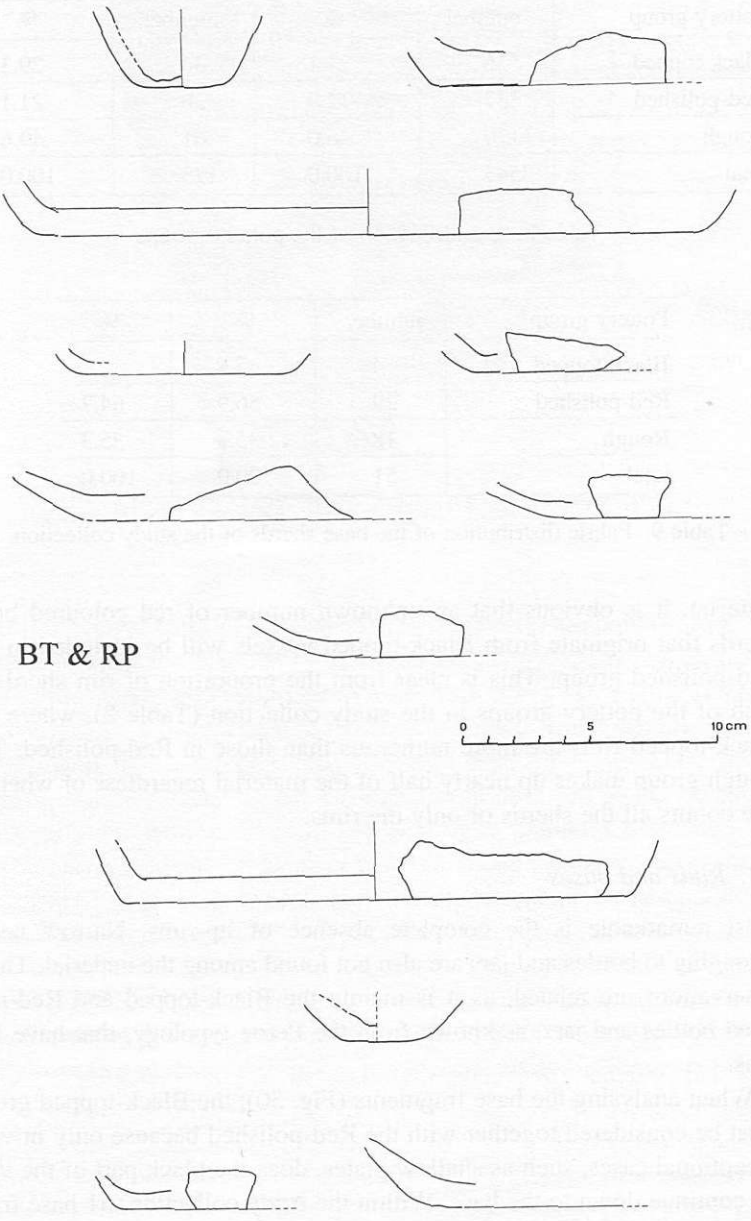


Fig. 30. El Abadiya 2 base types

fragments cannot be identified as such. The most readily recognised part of a base is the angular transition between the vessel wall and the base itself, thus rounded base fragments are very difficult to identify. The relatively low proportion of base fragments in the Rough group as compared to the Black-topped / Red-polished groups, is notable. This indicates that Rough pottery shapes are more likely to occur with rounded bases than Black-topped and Red-polished types.

7.4. Pottery types

The shape variation of the El Abadiya 2 pottery is limited, as can be seen from the small number of shape groups that could be distinguished and the absence of necked shapes.[2]

USx. Unrestricted, simple contour, profile with convex curve.
USv. Unrestricted, simple contour, profile with concave curve or straight.
UIv. Unrestricted, inflected contour, profile with concave curve or straight.
RSx. Restricted, simple contour, upper part of profile with convex curve.
RSv. Restricted, simple contour, upper part profile with concave curve.

The limited amount of diagnostic pottery fragments makes a detailed statistical approach to vessel shape and vessel type impossible. The small size of most of the fragments, furthermore, only allows tentative identification of vessel shapes. The typological analysis will therefore remain restricted to an attempt to identify certain vessel shapes for each pottery group. These vessel shapes do not necessarily represent specific vessel types. The full range of shapes cannot be distinguished, and within each shape as determined from the sherds, a number of different whole vessel types may originally have been present.

7.4.1. Black-topped (Figs. 31-32)

BT.1. Unrestricted bowl,[3] USx (ME 01/11/81).
BT.2. Unrestricted cups, USx (ME 01/06/98, 01/10/84, 01/11/81).
BT.3. Unrestricted cups, Usv (ME 01/11/51, 01/11/81, 01/06/77, 01/06/77).
BT.4. Unrestricted cups, UIv (ME 01/06/01).

[2] For the general principles and applications of this shape classification system, see Nordström 1972; Holthoer 1977; Hendrickx 1994; Hendrickx *et al.* 2001.
[3] Terminology for bowls, cups, beakers etc. after Hendrickx 1994: 52-54.

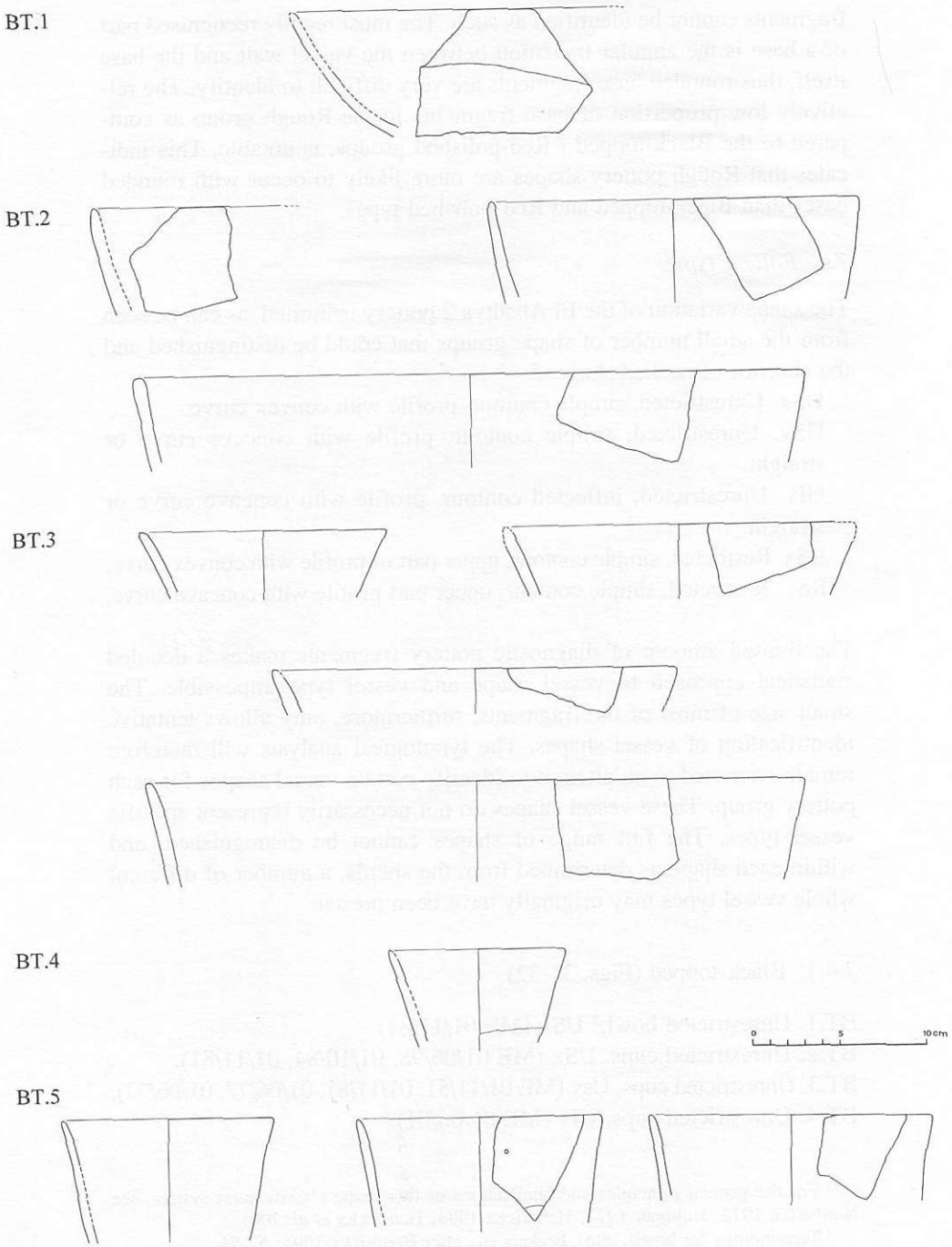


Fig. 31. Black-topped pottery types BT.1-5

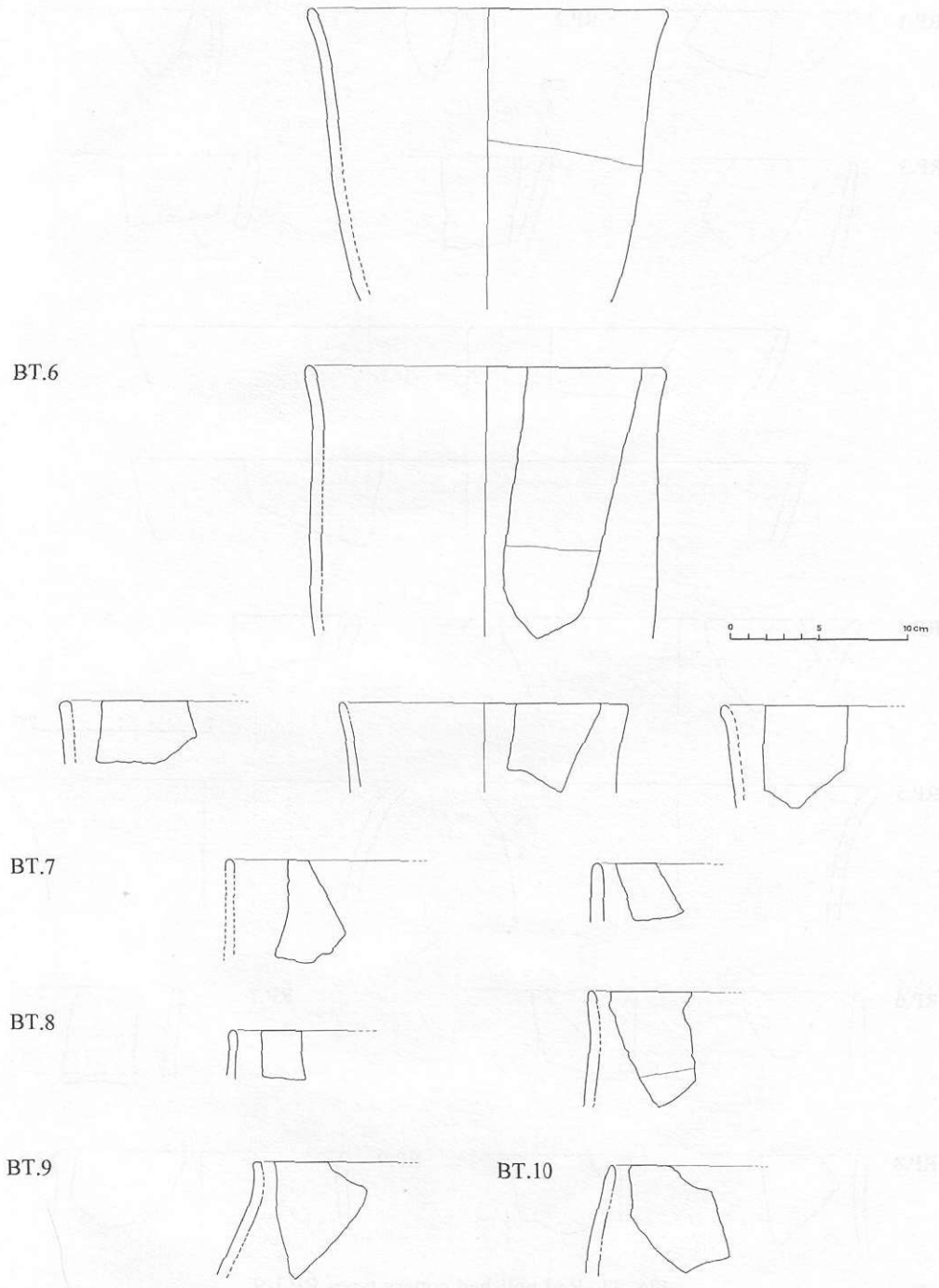


Fig. 32. Black-topped pottery types BT.5-10

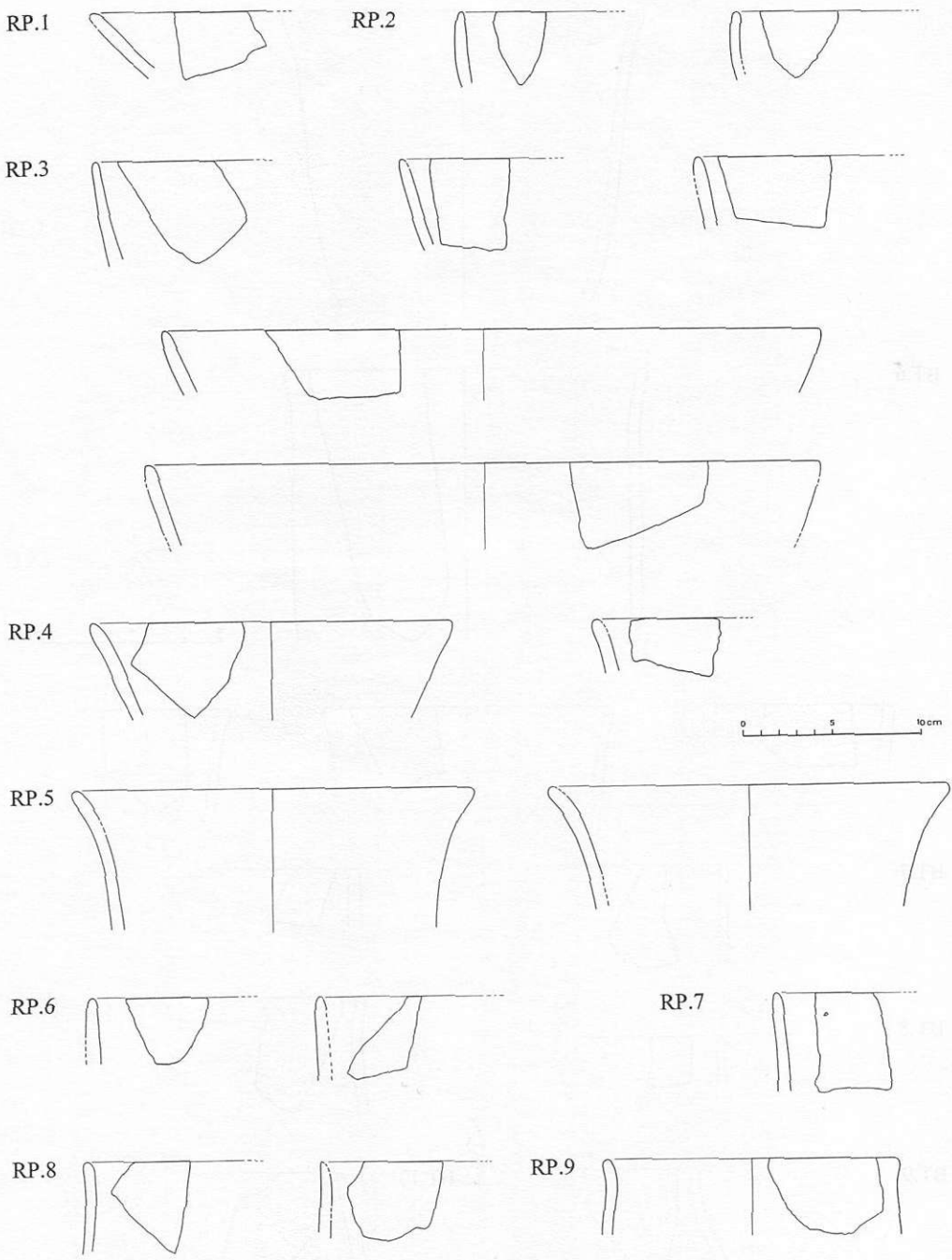


Fig. 33. Red-polished pottery types RP.1-9

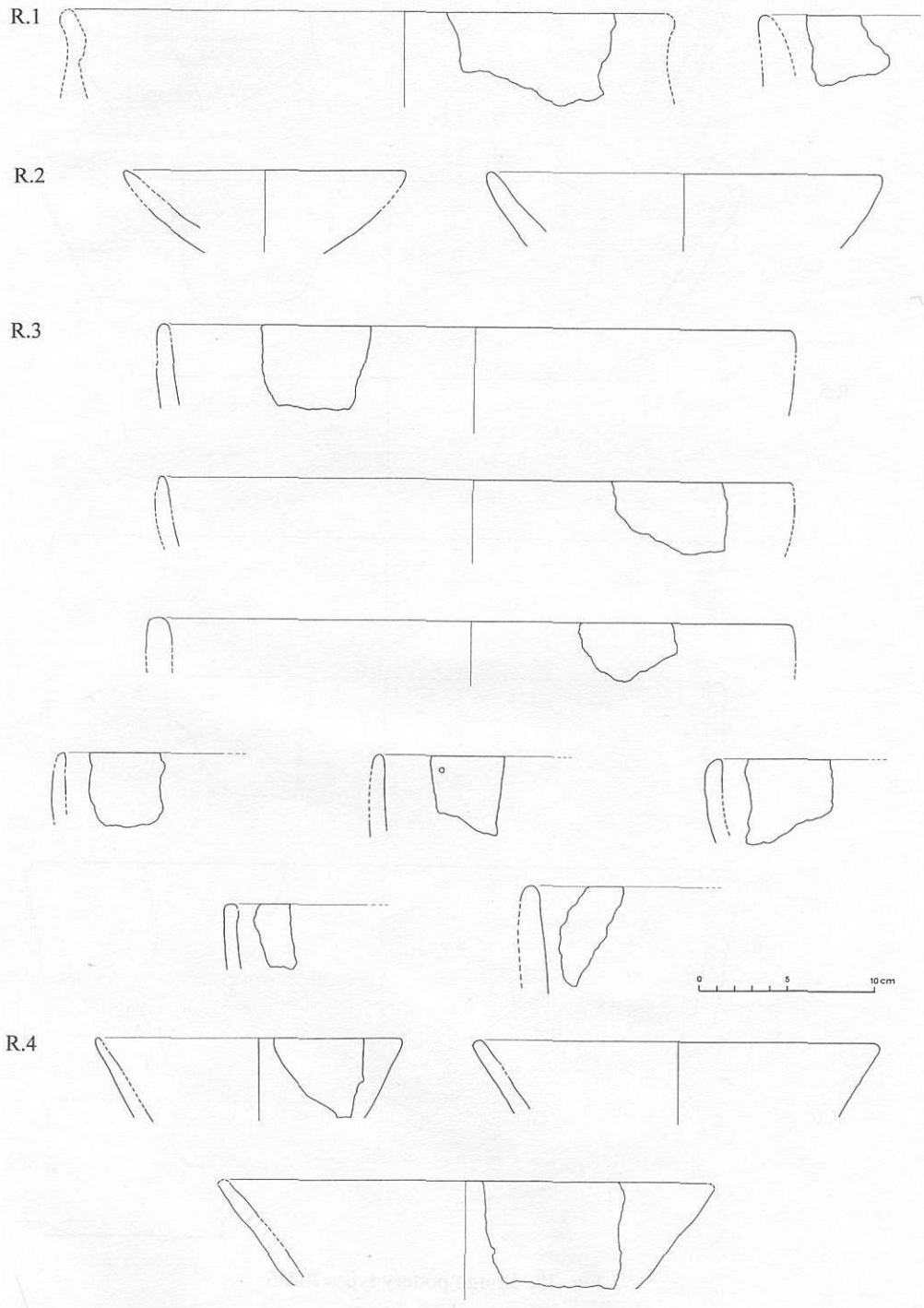


Fig. 34. Rough pottery types R.1-4

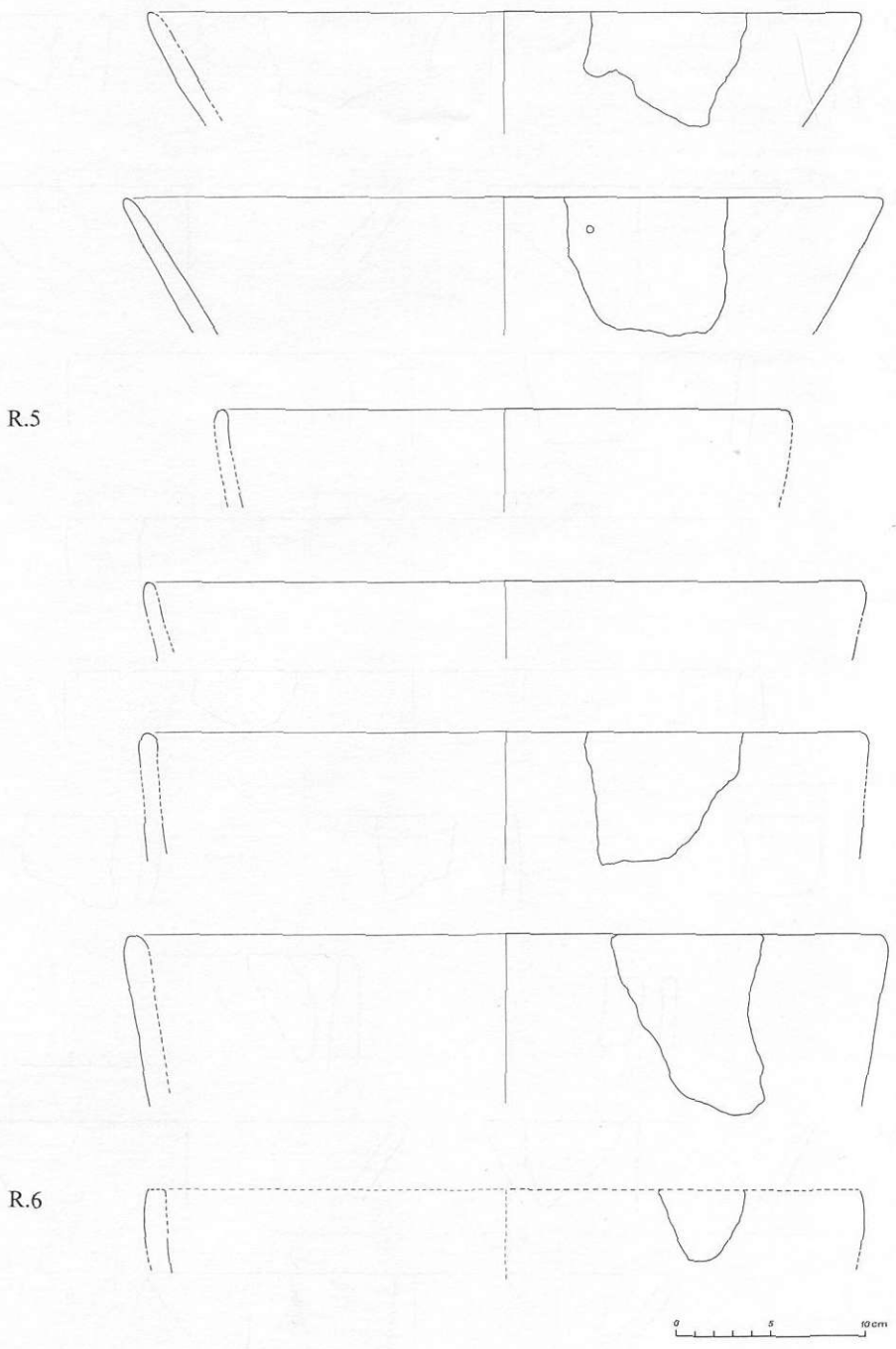


Fig. 35. Rough pottery types R.4-6

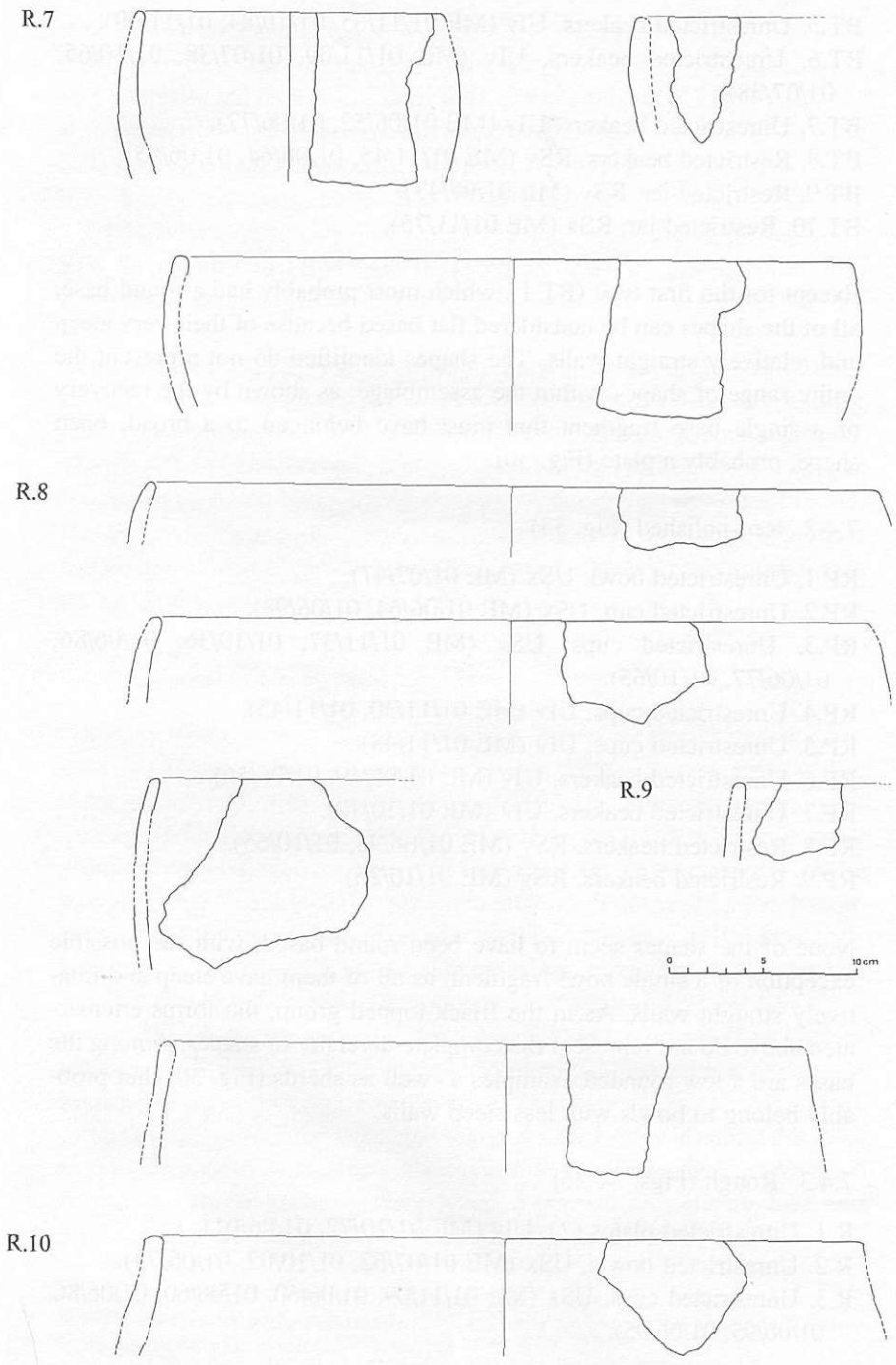


Fig. 36. Rough pottery types R.7-10

BT.5. Unrestricted beakers, UIv (ME 01/11/65, 01/10/84, 01/11/09).
BT.6. Unrestricted beakers, UIv (ME 01/11/09, 01/07/38, 01/10/65, 01/07/38).
BT.7. Unrestricted beakers, UIv (ME 01/06/52, 01/06/77).
BT.8. Restricted beakers, RSv (ME 01/11/45, 01/06/64, 01/06/95).
BT.9. Restricted jar, RSv (ME 01/07/47).
BT.10. Restricted jar, RSx (ME 01/11/75).

Except for the first type (BT.1), which most probably had a round base, all of the shapes can be considered flat based because of their very steep and relatively straight walls. The shapes identified do not represent the entire range of shapes within the assemblage, as shown by the recovery of a single base fragment that must have belonged to a broad, open shape, probably a plate (Fig. 30).

7.4.2. Red-polished (Fig. 33)

RP.1. Unrestricted bowl, USx (ME 01/07/47).
RP.2. Unrestricted cup, USx (ME 01/06/64, 01/06/98).
RP.3. Unrestricted cups, USv (ME 01/11/37, 01/10/36, 01/06/86, 01/06/77, 01/10/65).
RP.4. Unrestricted cups, UIv (ME 01/11/30, 01/11/45).
RP.5. Unrestricted cups, UIv (ME 01/11/45).
RP.6. Unrestricted beakers, UIv (ME 01/06/49, 01/06/56).
RP.7. Unrestricted beakers, UIv (ME 01/10/72).
RP.8. Restricted beakers, RSv (ME 01/06/95, 01/10/65).
RP.9. Restricted beakers, RSv (ME 01/10/26).

None of the shapes seem to have been round based, with the possible exception of a single bowl fragment, as all of them have steep and relatively straight walls. As in the Black-topped group, the forms enumerated above do not represent the complete diversity of shapes. Among the bases are a few rounded examples as well as sherds (Fig. 30) that probably belong to bowls with less steep walls.

7.4.3. Rough (Figs. 34-36)

R.1. Unrestricted plates (?), UIv (ME 01/10/72, 01/06/01).
R.2. Unrestricted bowls, USx (ME 01/07/62, 01/10/02, 01/06/73).
R.3. Unrestricted cups, USx (ME 01/11/09, 01/06/60, 01/06/60, 01/06/86, 01/06/95, 01/06/95).

R.4. Unrestricted cups, USv (ME 01/07/55, 01/06/12, 01/11/37, 01/11/51, 01/10/65).
R.5. Unrestricted cups, USv (ME 01/10/59, 01/06/01, 01/06/29).
R.6. Unrestricted beakers (?), UIv (ME 01/06/77).
R.7. Restricted cups, RSx (ME 01/10/65, 01/06/91).
R.8. Restricted cups, large, RSx (ME 01/11/45, 01/06/60, 01/10/72, 01/60/82).
R.9. Restricted cups, RSv (ME 01/10/65, 01/06/01).
R.10. Restricted jars: RSv (ME 01/10/72).

Round or rounded bases were probably present for all of the unrestricted bowls. Considering the prevalence of rounded bases in this group, it is not clear if the unrestricted cups, despite their steep walls, had rounded bases. The large unrestricted cups certainly seem to have had rounded bases, as fragments of round bases fitting the size of these cups have been found.

The identification of unrestricted plates and of unrestricted beakers can be questioned because of the inconclusive character of the fragments on which this is based.

7.4.4. General characteristics

For each of the pottery groups a number of vessel shapes can be considered characteristic (Table 10). Among them are two shapes: the unrestricted cup with convex contour and the unrestricted cup with concave contour, both of which are well represented in each pottery group. It is, however, to be noted that they are more common in the Rough group. This is only one element that distinguishes the Rough group from the two others. The Black-topped and Red-polished groups have nearly all of their vessel shapes in common, but this is not the case for the Rough group. This does not come as a surprise. The close connection in shape between Black-topped and Red-polished pottery has been known for some time and may reflect a common maker for both pottery groups (*e.g.*, Friedman 1994: pass.).

The holes intended for mending broken vessels further illustrate this division in the pottery assemblage. They occur only occasionally, but are more frequent on Black-topped and Red-polished pottery (respectively 2.2% and 3.2% of the total number of sherds) than in the Rough group (0.3%).[4]

[4] The number of perforated sherds is only slightly inferior to that from the Badarian living site at Mahgar Dendera 2 (Hendrickx *et al.* 2001: 62-63).

	Black-topped		Red-polished		Rough	
	n	%	n	%	n	%
UIv plate	-	-	-	-	(?) 2	3.3
USx bowl	1	2.8	-	-	4	6.6
USv bowl	-	-	1	3.8	-	-
USx cup	6	16.7	3	11.5	18	29.5
USv cup	4	11.1	5	19.2	13	21.3
UIv cup	1	2.8	3	11.5	-	-
UIv beaker	15	41.7	7	26.9	(?) 3	4.9
RSx cup	-	-	-	-	11	18.0
RSx jar	1	2.8	-	-	-	-
RSv cup	-	-	-	-	3	4.9
RSv beaker	4	11.1	3	11.5	-	-
RSv jar	1	2.8	-	-	-	-
unidentified	3	8.3	4	15.4	7	11.5
total	36	100.0	26	100.0	61	100.0

Table 10. Frequencies of the vessel shapes of the different pottery groups

7.5. Chronology

As it is impossible to reconstruct even a single complete vessel profile, the material can only to a limited extent be compared with the traditional Predynastic pottery typology, which is based on complete vessels (Petrie 1921 and more recent additions, *cf.* Hendrickx 1996: 44, 65, n.13). Furthermore, this typology is based on cemetery material in which several types of vessels characteristic for settlements rarely occur (*cf.* Friedman 1994; Buchez 1998: 86-89).

The relative chronology of the Naqada culture is still largely based on evidence published according to Petrie's (1921) pottery typology (Hendrickx 1989, 1996; 1999; in press). Unfortunately, only a limited number of the vessel fragments from El Abadiya 2 can be integrated into Petrie's typology with any degree of certainty (Table 11).

It is to be stressed that the identification of the Petrie types given in Table 12 can only be considered tentative. It is nevertheless obvious that the types identified tend to cluster in the Naqada I period. This seems to be confirmed by the general characteristics of the pottery and the quantitative dominance of Black-topped over Red-polished. The Black-topped

Vessel shape	Excavation n°	Petrie 1921 type (tentative)	Naqada period (Hendrickx 1989)	Khattara sites (Friedman 1994)
BT.1 USx bowl	01/11/81	B 1 -	I-II	2-1b3 black (fig. 8.5.d)
BT.2 USx cup	01/05/98, 01/10/84	B 2 - / B 19 -	I-II	2-1b1 black (fig. 8.4.g)
BT.3 UIv cup	01/06/77	B 18 -	[IB-IIA]	2-1b1 black (fig. 8.4.e)
BT.4 UIv cup	*01/06/01*	*B 18 -*	*[IB-IIA]*	*2-1c1 black (fig; 8.6.j)*
BT.5 UIv beaker	01/11/65	B 18 c / 19 e-f	[IB] / IC	2-1c1 black (fig. 8.6.k)
BT.5 UIv beaker	01/11/09	B 18 h / 21 c-d	- / [IB]	-
BT.5 UIv beaker	01/10/84	B 19 f (?)	IC	2-1c1 black (fig. 8.6.k)
BT.6 UIv beaker	01/07/38	B 22 -	[IA-IC]	2-1d1 black (fig. 8.7.e)
	01/11/09	B 25 c	IB-IC	2-1d1 black (fig. 8.7.b)
	01/10/65	B 27-29	[IA-IC]	2-1c1 black (fig. 8.6.f)
BT.7 UIv beaker	01/06/77	B 29 d-f	IA-IC	2-1d1 black (fig. 8.7.e)
BT.8 RSv beaker	01/11/45	B 35 -	IC-IIB	2-1d1 black (fig. 8.7.g)
BT.9 RSv jar	01/07/47	B 64 e (?)	-	2-2b2 black (fig. 8.10.l)
BT.10 RSx jar	*01/11/81*	*B 84 a-b*	IC	2-2a2 (fig. 8.9.a; *cf.* also fig. 8.12.m)
RP.1 USx bowl	01/07/47	P 11 -	I-II	2-1b3 red (fig. 8.5.a)
RP.2 USx cup	01/06/98	P 23 a-b	[IIB-IIC]	-
RP.3 USv cup	01/11/37	P 1 b (?)	IC	2-1b3 red (fig. 8.5.b)
RP.4 UIv cup	*01/11/45*	*P 15 / 17 (?)*	*[IB-IC]*	*2-1b1 red (fig. 8.4.c)*
RP.5 UIv cup	01/11/45	P 19 d	-	2-1d2 red (fig. 8.8.e)
RP.6 UIv beaker	01/06/56	-	-	2-1c1 red (fig. 8.6.i) (?)
RP.7 UIv beaker	01/10/72	-	-	2-1c1 red (fig. 8.6.g)
RP.8 RSv beaker	01/10/65, 01/06/95	P 62 n (?)	-	2-1d1 red (fig. 8.7.l)
RP.9 RSv beaker	01/10/26	P 68 -	IA-IB	-
R.1 UIv plate (?)		-	-	-
R.2 USx bowl	01/10/02	-	-	27-1b (fig. 8.14.c) / 7-1b (fig. 8.14.g)
R.3 USx cup	01/11/09, 01/06/60	-	-	27-1a (fig. 8.15.b)
R.4 USv cup	01/07/55	-	-	27-1b (fig. 8.14.a) / 7-1b (fig. 8.14.f)
R.5 USv cups	01/10/59, 01/06/01	R 32 a (?)	-	27-1b (fig. 8.14.b)
R.6 UIv beaker (?)		-	-	-
R.7 RSx cup	01/10/65	-	-	27-2a (fig. 8.16.e)
	01/06/91	-	-	26-1a (fig. 8.21.c)
R.8 RSx large cup	01/11/45	-	-	27-2a (fig. 8.16.a) / 7-2a (fig; 8.16.g)
R.8 RSx large cup	01/06/60	-	-	27-1a (fig. 8.15.a)
R.9 RSv cup	01/06/01	-	-	27-2a (fig. 8.16.c) / 7-2a (fig. 8.16.g)
R.10 RSx jar	01/10/72	-	-	7-2g (fig. 8.17.a) (?)

Table 11. Typological identification after Petrie (1921) and Friedman (1994), and relative chronological interpretation using Petrie types (Hendrickx 1989)

types represented consist mainly of steep bowls (B 18-19) and large beakers (B 22-35) as well as a few restricted jars (B 64 e/B 84 a-b). The shapes of the few Red-polished types that could be identified are strongly related to the Black-topped types. Comparison of the Rough shapes with Petrie's Rough types makes little sense for several reasons. As mentioned above, many Rough types are not found in cemeteries, and the fabric of the El Abadiya 2 organic tempered pottery is probably not always identical to that of Petrie's Rough class. In addition, Rough pottery only appears in cemeteries during the Naqada II period, a time which is probably too recent for El Abadiya 2, as the other ceramic groups and artefacts clearly point to a date in the Naqada I period. On a general level, the most important dating indications are the limited shape variation as well as the absence of lip-rims, which also indicate a rather early date in the Naqada I period as is confirmed by the parallels from cemeteries. Furthermore, the Black-topped types characteristic for Naqada IC-IIB, such as the restricted regularly curved jars with wide aperture (B 56-58), those with a more pronounced rim (B 53) or shouldered jars (B 74-78), have not been identified at El Abadiya 2. For all of these reasons, a date in Naqada IA-IB can be proposed, implying an absolute date around 3900-3800/3700 cal BC, which fits well with the available radiocarbon dates from the site (*cf. supra*).

7.6. Discussion

The ceramic material from El Abadiya 2 clearly illustrates the difference between Predynastic cemetery and settlement pottery. This is especially obvious from the large Rough restricted cups (orifice diameters between 25 and 40 cm, Figs. 34-36), which rarely occur in the Petrie (cemetery) typology (*cf.* Petrie 1921: pl. XXXVIII-XXXIX). The large majority of these vessels is characterised by a steep, rather straight vessel wall, making an angle of almost 90° to the orifice plane. Such shapes, in different fabrics, throughout the Naqada culture are most characteristic for cooking vessels (*e.g.*, Friedman 1994: pass.; Midant-Reynes & Buchez 2002: 211, 255, 233-234, 262; Buchez 2004). This functional association is corroborated by the presence of soot on the outside of about 5% of the Rough sherds, a phenomenon which is almost completely absent in the Black-topped and Red-polished groups.

The absence of cooking vessels in cemeteries has regularly been noted and can probably be explained by the fact that items associated with the chores of daily life, such as the preparation of food, were rarely included in Naqada tombs (Hendrickx 1994: 94).

The characteristics of the El Abadiya 2 pottery can be considered typical for a settlement, if only because of the prevalence of cooking vessels. The second important function of pottery in a settlement, the storage of various types of goods, was apparently fulfilled by large beakers. It is, however, to be noted that these beakers could not be tightly sealed, as they lack the lip-rim which allowed for the affixing of a lid or seal held on with string. The large beakers, therefore, seem to point to relatively short term storage. Long-term storage of grain, for example, may have taken place in silos.

As the lithic material, the pottery from El Abadiya 2 is best compared with that from the nearby Khattara sites (Friedman 1994: 458-539), dated to the (early) Naqada I period (Friedman 1994: 504-508). Most of the Khattara sites show proportions of Black-topped / Red-polished and Rough pottery similar to those from El Abadiya 2 and a complete or almost complete absence of marl clay pottery (*cf.* Friedman 1994: table 8.1). Furthermore, nearly all of the vessel shapes from El Abadiya 2 are paralleled at the Khattara sites (*cf.* Table 12), although the presence of the organic and grog tempered Fabric/temper class 27 at El Abadiya 2 remains to be confirmed. The vessel types with lip-rims from Khattara (Friedman 1994: fig. 8.10-11) are, however, not represented at El Abadiya 2, although BT.9 is related to them.

The differences with the Badarian pottery from Mahgar Dendera 2 (Hendrickx *et al.* 2001: 59-86) are easy to observe. Beakers and cups with an inflected contour are completely lacking in the Badarian material, and the characteristic Badarian rippled surfaces are not attested at El Abadiya 2. There are, however, important resemblances between the two assemblages, such as the presence of large round based cooking vessels and the absence of lip-rims. These similarities seem to confirm further the chronological position of El Abadiya 2 at the beginning of the Naqada I period.

8. Bone Tools

In both sectors, bone points (Fig. 37) have been found that were made from metacarpals, metatarsals and tibiae of ovicaprines and gazelle. Because of their regular and straight shaft, these bones are the most suitable elements within a herbivore skeleton to make such objects. Of a total of 16 bone points, 2 were definitely from gazelle metapodals and 10 were made out of metacarpals or metatarsals of sheep/goat. In 3 other cases it was impossible to identify from which small bovids they were

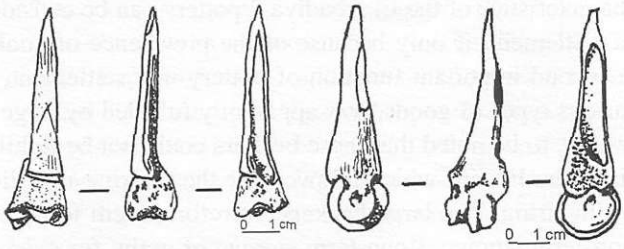


Fig. 37. Bone points

derived. The latter bone points were incompletely preserved with only a pointed shaft fragment remaining of what may have been a tibia or a metapodal. The bone points at El Abadiya 2 that were made from metapodals can be classified as Type 8, *poinçon sur métapode fendu de petit ruminant*, as described by Camps-Fabrer (1990). As was shown by experiments (*e.g.*, Camps-Fabrer & d'Anna 1976), the production of these polished points from metapodals involved first a longitudinal splitting of the bone following the dorsal longitudinal groove (*sulcus longitudinalis dorsalis*), and later the removal of one epiphyseal end (in most cases the proximal one), followed by sharpening and smoothing to obtain a pointed object.

Similar bone points have been found at Adaïma (Midant-Reynes & Buchez 2002: 436-437) that were all made from ovicaprine metapodals and tibiae. In 8 cases, half distal metatarsals were used, whereas one point consisted of a complete distal metacarpal. The latter object would classify as Type 6, *poinçon pris sur métapode entier de petit mammifère*, as defined by Camps-Fabrer (1990). Another recently excavated Upper Egyptian site where bone points made of ovicaprid distal metapodals and tibiae were found is the Badarian site of Mahgar Dendera 2 (Hendrickx *et al.* 2001). Previously, similar objects had been reported from other Badarian settlements (Brunton & Caton-Thompson 1928 and references therein) and Naqada sites (Brunton & Caton-Thompson 1928; Brunton 1937).

9. Faunal Remains

Table 12 gives an overview of the faunal remains recovered from the Predynastic contexts of El Abadiya 2. Of the 949 specimens, 601 could be identified, and they belonged to at least 22 different animal taxa.

Among the molluscs, only bivalves were found, and it is likely that they were all collected by the inhabitants of the site. This is the case not only for the identified taxa *Coelatura aegyptiaca*, *Etheria elliptica*, *Spathopsis rubens* and *Spathopsis rubens/Mutela nilotica*, but also for the unidentified bivalves, which are of the same size-class. Except for *Spathopsis rubens* that can aestivate in the floodplain, all these molluscs live exclusively in the main river bed of the Nile. The fish fauna consists of taxa that are typical open water species (Nile perch, *Lates niloticus*, *Bagrus* and *Synodontis* catfish) and of another category of more tolerant fish that prefer rather shallow water (Clariidae catfish, tilapia, and Cyprinidae, among which *Barbus bynni* and *Labeo* sp. could be identified). Another aquatic creature found is the soft-shelled turtle. Among the heavily fragmented bird remains, only one specimen was identifiable as a garganey teal. The mammal remains consist mainly of the traditional domestic animals (dog, cattle, sheep, goat, pig) and a smaller amount of wild mammals that were hunted (dorcas gazelle and hartebeest, possibly also the red fox). Small rodent remains are abundant and include the Nile rat (*Arvicanthis niloticus*) and gerbil (*Gerbillus* sp.). These animals should be considered as intrusive because of their burrowing habits, and it is not excluded that the red fox should also be added to this category.

9.1. Distribution of the faunal remains

As with the lithics and the ceramics, the faunal material was examined to see if a particular pattern would emerge in the horizontal or vertical distribution of the finds. In Table 13 the relative abundance of the major animal groups is indicated for the different sectors and levels at El Abadiya 2, with the exclusion of the assemblage from South 2 and from the profile of the North Sector, in which the number of remains was very low. Sample size is still rather small in some of the retained assemblages, and chance fluctuations may therefore play a role in the observed distributions. The only significant trend that seems to emerge from the distributions in Table 13 is that small rodents are poorly represented in the upper levels and that they become more abundant in the middle and lower levels. This is the case for both the South and the North Sector and is due to the fact that these remains represent burrowing animals that died in their burrows. Since no other tendencies were discovered in the distribution, all the material will be considered as one assemblage in the further interpretation of the fauna.

	South					South 2*	North					TOTAL
	Upper	Middle	Lower	Profile	Total South	Upper	Upper	Middle	Lower	Profile North	Total	
Molluscs												
Spathopsis rubens	1	1	2	-	4	-	-	1	-	-	1	5
Spathopsis rubens/ Mutela nilotica	2	1	1	-	4	-	-	-	-	-	-	4
Nile oyster (*Etheria elliptica*)	-	-	1	-	1	-	-	-	-	1	1	2
Coelatura aegyptiaca	-	1	-	-	1	-	-	-	-	-	-	1
unidentifiable large bivalves	4	2	7	-	13	-	2	3	2	1	8	21
Fish												
barbel (*Barbus bynni*)	-	-	-	-	-	-	1	-	2	-	3	3
mud carp (*Labeo* sp.)	-	-	-	1	1	-	-	-	-	-	-	1
minnows (Cyprinidae indet.)	-	-	-	-	-	-	-	2	-	-	2	2
catfish (*Clarias* sp.)	1	-	-	-	1	-	-	-	-	-	-	1
catfish (Clariidae)	3	4	2	-	9	1	1	5	1	-	7	17
catfish (*Bagrus bajad*)	-	1	-	-	1	-	-	-	-	-	-	1
catfish (*Bagrus* sp.)	2	-	-	-	2	-	-	1	1	-	2	4
catfish (*Synodontis* sp.)	1	3	3	1	8	-	1	2	1	-	4	12
Nile perch (*Lates niloticus*)	-	1	3	-	4	-	1	1	-	-	2	6
tilapia (Tilapiini)	2	3	3	2	10	-	-	2	-	-	2	12
unidentifiable fish	2	1	5	-	8	-	2	1	2	1	6	14
Reptiles												
soft-shelled turtle (*Trionyx triunguis*)	-	-	-	-	-	-	-	-	1	-	1	1
Birds												
garganey teal (*Anas querquedula*)	-	-	-	1	1	-	-	-	-	-	-	1
unidentifiable birds	1	1	4	-	6	-	1	1	-	-	2	8
Mammals												
Nile rat (*Arvicanthis niloticus*)	2	8	8	-	18	-	1	2	10	-	13	31
gerbil (*Gerbillus* sp.)	-	4	11	3	18	-	-	3	1	-	4	22
unidentifiable small rodent	-	2	2	-	4	-	-	1	-	-	1	5
red fox (*Vulpes vulpes*)	1	1	2	1	5	-	-	-	-	-	-	5
hartebeest (*Alcelaphus buselaphus*)	-	-	-	-	-	-	-	1	1	-	2	2
dorcas gazelle (*Gazella dorcas*)	4	3	9	-	16	2	5	5	3	-	13	31

	South					South 2*	North					TOTAL
	Upper	Middle	Lower	Profile	Total South	Upper	Upper	Middle	Lower	Profile North	Total	
dog (*Canis lupus* f. familiaris)	-	1	-	-	1	-	-	2	-	-	2	3
pig (*Sus scrofa* f. domestica)	6	4	12	6	28	1	8	11	4	-	23	52
cattle (*Bos primigenius* f. taurus)	5	11	8	1	25	-	7	8	3	-	18	43
goat (*Capra aegagrus* f. hircus)	2	10	7	4	23	-	2	6	2	-	10	33
sheep (*Ovis ammon* f. aries)	1	2	3	-	6	1	1	1	-	-	2	9
sheep/goat (*Ovis/Capra*)	13	28	24	9	74	1	10	17	13	6	46	121
small bovids	9	15	28	4	56	7	17	11	10	1	39	102
small ungulates	-	7	3	-	10	-	2	1	-	1	4	14
large bovids	9	10	13	3	35	-	11	4	5	-	20	55
unidentifiable mammals	41	50	70	16	177	7	40	55	24	2	121	305

Table 12. Animal remains from the various sectors and levels at El Abadyia 2. The figures indicate number of individual specimens (NISP). "Small bovids" represent remains that can be either sheep/goat or gazelle, the "small ungulates" category includes small bovids and pig, whereas the "large bovids" are either cattle or hartebeest

* South 2 refers to a small surface collection which was not taken into consideration for the study of the lithic and ceramic material.

9.2. Palaeo-economy

Taking into account the behaviour of many of the identified wild species and their seasonal changes in abundance and accessibility to humans, it is possible to broadly define in which season the various food resources were exploited. Access to the molluscs is determined by the water level of the Nile; with the exception of *Spathopsis rubens*, all the collected bivalves live exclusively in the main channel and are therefore most easily exploited when the waters are low. Similarly, the best season for the capture of certain fish is when the Nile waters are low. This is the case for the Nile perch, the *Bagrus* and *Synodontis* catfishes, which are typical inhabitants of the main river, and need well oxygenated, permanent water. Nile perch and *Bagrus* catfish do not enter the floodplain for

	South					North				Grand total
	Upper	Middle	Lower	Profile	Total South	Upper	Middle	Lower	Total North	
NISP	53	93	117	29	291	43	76	47	175	472
	%	%	%	%	%	%	%	%	%	%
all molluscs	13.2	5.4	9.4	0.0	7.6	4.7	5.3	4.3	5.7	6.8
all fish	20.8	14.0	13.7	13.8	15.1	14.0	18.4	14.9	16.0	15.5
soft-shelled turtle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	0.6	0.2
all birds	1.9	1.1	3.4	3.4	2.4	2.3	1.3	0.0	1.1	1.9
consumed domestics	50.9	59.1	46.2	69.0	53.6	65.1	56.6	46.8	56.6	54.7
consumed hunted mammals	7.5	3.2	7.7	0.0	5.5	11.6	7.9	8.5	8.6	7.0
intrusive rodents	3.8	15.1	17.9	10.3	13.7	2.3	7.9	23.4	10.3	12.3
red fox	1.9	1.1	1.7	3.4	1.7	0.0	0.0	0.0	0.0	1.1
dog	0.0	1.1	0.0	0.0	0.3	0.0	2.6	0.0	1.1	0.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 13. Proportion of the major animal groups in various sectors and levels at El Abadyia 2. The NISP on which the percentages are based is indicated for each assemblage.

spawning (or only for a very short period during the maximum flood). Clariid catfish, tilapia and cyprinids, on the other hand, are typical inhabitants of shallow waters and are most easily captured during their stay on the floodplain. Two peaks in the fishing season can occur, namely at the beginning of the floods when the fish are spawning and, later on, when residual pools are formed on the floodplain once the waters start to recede (Van Neer 1994). It thus seems that fishing was an activity that could be carried out almost all year round; only in the period just after the spawning season, during which the waters were still high but the spawning fish no longer occurred inshore, the yields may have been minimal. However, since the dry climate allows easy sun drying of fish, it is conceivable that fish was an important source of protein throughout the year. Prehistoric bird remains in the Nile valley often comprise species that are typical winter visitors to Egypt (Hassan 1984a: 60; Gautier 1988), and at El Abadiya 2 the only identified bird, *i.e.* the garganey teal, is such a species.

The presence of all of the aforementioned taxa indicates that the site was inhabited year round, as can be expected from its extent. No traces of deflation were found that would be expected if the site had been

deserted during part of the year. Defining when the exploitation of the wild mammals, dorcas gazelle and hartebeest, took place is less straightforward. It has been suggested previously that hunting or snaring of gazelles would have been more successful when the Nile levels were low and the animals ventured closer to the inhabited areas along the Nile (Gautier & Van Neer 1989: 155). Similarly, hartebeest may have come closer to the main river in the period just before the annual floods when fodder was limited. The domestic animals could in theory have been slaughtered all year round, but it is impossible to verify if this was practised more intensively during particular seasons within the year since good seasonality indicators (dental eruption or epiphyseal fusion data) are lacking in the El Abadiya 2 material.

When the number of identified specimens (NISP) of the consumed taxa is taken as a measure for the intensity with which the various food procurement strategies were carried out, it appears that domestic stock keeping was the major activity, followed by hunting, fishing, mollusc collecting and fowling (Fig. 38). A similar exercise was carried out for the domestic animals and shows that sheep and goat herding predominated,

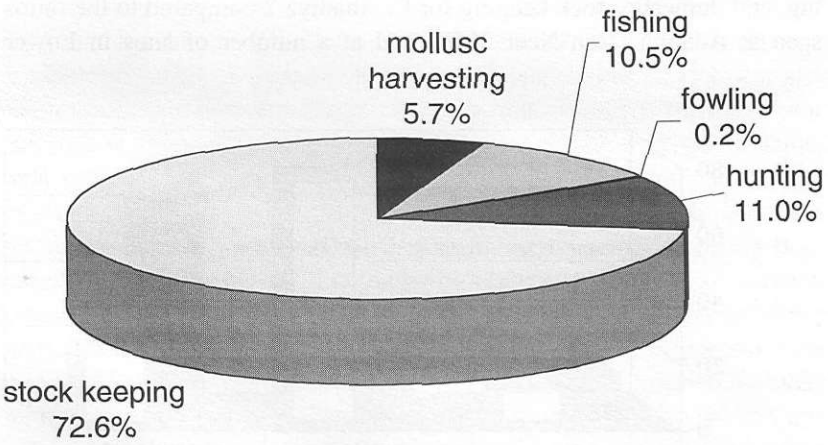
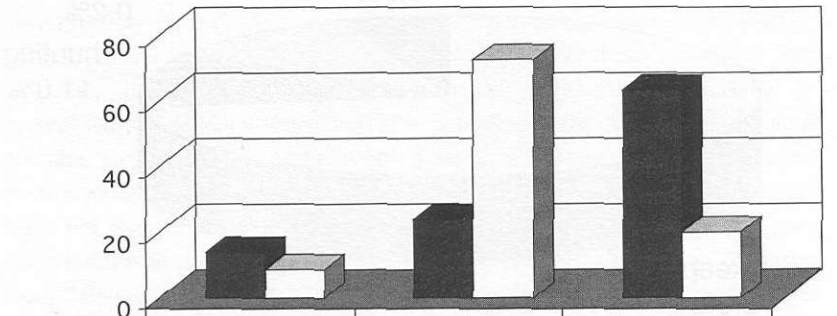


Fig. 38. Proportions of the different food procurement strategies, based on the NISP of consumed taxa (n = 563). The specimens identified as "small bovids" have been added to the NISP of sheep/goat and gazelle listed in Table 12, in a ratio equal to that of the specifically identified material. A similar procedure was carried out for the "small ungulates", a category including small bovids and pig, and for the "large bovids" comprising cattle and hartebeest

followed by pig and cattle keeping (Fig. 39; black columns). The latter ratios are only a measure of the slaughter frequency of the various species, and do not indicate their dietary importance. When the figures for the domestic animals are multiplied by their respective, estimated total weight, a measure is obtained for the meat yield. As in the Predynastic material from Adaïma (Van Neer 2002), the values used were 70 kg for pig, 35 kg for sheep/goat and 350 kg for cattle. It appears that cattle must be considered as the major provider of animal protein, followed by ovicaprines and pig (Fig. 39: white columns). The number of domestic animal remains that allows an estimation of the age at slaughtering is small at El Abadiya 2, but the pigs were clearly killed at a much younger age than the cattle and ovicaprines. A similar pattern was observed elsewhere in Egypt, *e.g.*, at Adaïma (Van Neer 2002) and Maadi (Boessneck *et al.* 1989), indicating that pigs were primarily kept for their meat, whereas in the other species, secondary products such as milk and hair may also have been of importance.

Comparisons with other Predynastic sites are hampered by several factors, especially preservation conditions and sampling procedures that may have had an influence on the faunal composition. Table 14 shows the relative importance of mollusc harvesting, fishing, hunting and fowling, and domestic stock keeping for El Abadiya 2 compared to the ratios seen at Adaïma (Van Neer 2002) and at a number of sites in Lower



	pig	cattle	sheep/goat
■ % NISP	13,4	23,5	63,1
□ % weight	8,3	72,3	19,4

Fig. 39. Proportion of the domestic food animals, based on the NISP (n = 409). The initial NISP listed in Table 12 have been recalculated so as to include the domestic animals from the categories "small bovids", "small ungulates" and "large bovids"

	El Abadiya 2 (n=563)	Adaïma 1001+ext (n=2506)	Adaïma 1002/1003 (n=501)	Adaïma total (n=3007)	Merimde I+II (n=9451)	Merimde IV+V (n=17172)	El-Omari (n=1558)	Maadi (n=7595)
	%	%	%	%	%	%	%	%
mollusc harvesting	5.7	2.2	2.6	2.3	5.2	0.4	1.7	7.5
fishing	10.5	29.6	5.0	25.5	33.9	42.4	65.2	10.6
hunting & fowling	11.2	1.9	1.2	1.8	2.3	4.0	5.2	2.4
domestic stock keeping	72.6	66.3	91.2	70.4	58.6	53.2	28.0	79.5

Table 14. Relative importance of the various food procurement strategies at El Abadiya 2 compared to those at Adaïma (Upper Egypt) and at Merimde, Maadi and El-Omari (Lower Egypt). Percentages are based on NISP.

Egypt: Merimde (von den Driesch & Boessneck 1985), Maadi (Boessneck *et al.* 1989) and El-Omari (Boessneck & von den Driesch 1990). For Adaïma, figures are given separately for two sectors because the sampling strategy was different. In sectors 1002 and 1003, sampling involved the use of 5 mm sieves, whereas 2 mm meshes were used in sector 1001. Because sieving was done on a 4 mm mesh at El Abadiya 2, the comparison with sectors 1002 and 1003 are the most valid. It appears that the contribution of domestic animals was high at all sites considered, although some of the Lower Egyptian sites show lower percentages of domestic stock and more fish. It is unclear if this difference reflects an economic reality or if the ratios are due to sampling strategies and state of preservation.

The most striking trend observed from Table 14 is the high proportion of game animals at El Abadiya 2, which results mainly from the large numbers of dorcas gazelle. Hunting was a minor activity at all Predynastic sites described in the literature thus far, the only exception being HK29A, the "temple" site at Hierakonpolis. In his contributions on the fauna of Hierakonpolis, McArdle (1982; 1992) does not mention the exact proportions in which wild game occurred. An analysis of the HK29A and HK11 faunal material, including remains from both the older excavations under the directorship of Michael Hoffman and the renewed activity directed by Renée Friedman, is presently being undertaken (Linseele & Van Neer, in preparation). It appears that only about 1% of the hoofed animals at the domestic settlement site HK11 are wild, whereas the temple site HK29A yielded about 15% wild ungulates, possibly indicating differences in function as well as status or identity among the inhabitants of the

two areas. The fact that wild animals played a role in ostentatious display is shown in the cemeteries at Hierakonpolis where wild species are only found at the elite cemetery HK6 (Van Neer *et al.* this volume).

It is unclear how the unusually high proportion of hunted animals should be explained at El Abadiya 2. There are no archaeological indications for high status structures at the settlement of El Abadiya 2. It is striking that the wild mammal fauna at this site consists almost entirely of gazelle, possibly indicating that it was located in an area that was very suitable for the capture of this particular herbivore. Maybe the region around El Abadiya was regularly visited by herds of this species? Resident dorcas gazelle tend to disperse in small parties, but they can converge on localised resources in larger numbers; when they are nomadic, these gazelles may form larger herds of up to one hundred head (Kingdon 1997). An alternative explanation could be that the observed pattern at El Abadiya 2 reflects economic reality in a sense that hunting was still a rather common practice at early Naqada sites. The other aforementioned Upper Egyptian Predynastic sites are all later than El Abadiya 2. Unfortunately, there is insufficient Badarian fauna available to verify whether there was indeed a gradual decrease in hunting through time. The only Badarian faunal assemblage described thus far from Upper Egypt is Mahgar Dendera 2, but this is a temporary campsite and therefore not comparable to the permanent settlements discussed here. At Mahgar Denderah 2, gazelles represent about 7% of the hoofed animals, the rest is livestock (Hendrickx *et al.* 2001).

The ratio of pig, ovicaprines and cattle are indicated in Table 15 for the aforementioned sites and, in addition, the proportions reported in

	El Abadiya 2 (n=409)	Adaïma 1001+ext. (n=1659)	Adaïma 1002/1003 (n=457)	HK11 (n=?)	HK29 (n=?)	HK29A (n=?)	Merimde I+II (n=5540)	Merimde IV+V (n=9140)	El-Omari (n=437)	Maadi (n=6038)
	%	%	%	%	%	%	%	%	%	%
pig	13.4	20.3	10.9	7.0	5.7	5.9	31.0	46.1	41.9	20.6
sheep / goat	23.5	51.3	29.3	64.4	27.0	55.8	49.4	31.1	23.3	41.1
cattle	63.1	28.4	59.8	28.6	67.4	38.2	19.6	22.8	34.8	38.3

Table 15. Relative importance of the domestic animals used for food, based on the NISP, for the Upper Egyptian sites El Abadiya 2, Adaïma and Hierakonpolis (HK) and for Lower Egyptian Merimde, El-Omari and Maadi.

the literature for three settlements at Hierakonpolis (McArdle 1982; 1992) are listed. The first clear trend that appears from this comparison is that pig remains are much more abundant at the sites located in Lower Egypt, a phenomenon that is no doubt related to environmental conditions. Pig rearing was probably more difficult in Upper Egypt due to the higher temperatures and drier conditions, a factor that may also explain the different ratios seen among the ovicaprines of the two regions. At El Abadiya 2, 42 ovicaprine remains could be identified to species, and it appears that about 80% of the remains belong to goat, a ratio that approaches that seen at Hierakonpolis. The new analyses show that goat represent almost 70% of the ovicaprines at HK29A and HK11 (Linseele & Van Neer, in preparation). In earlier work, based on smaller samples from these sites, an equal proportion of sheep and goat was indicated (McArdle 1982). At HK29, goat are said to outnumber sheep by 2:1 (McArdle 1992). At Adaïma, 60% of the ovicaprines are goat (Van Neer 2002). In Lower Egypt, sheep and goat occurred in more or less equal proportions at El-Omari (Boessneck & von den Driesch 1990) and Maadi (Boessneck *et al.* 1989), whereas an exceptionally high proportion of sheep is found at Merimde (35 sheep: 1 goat) (von den Driesch & Boessneck 1985).

The proportions of the consumed domestic mammals at El Abadiya 2 correspond well to those observed at Adaïma's sectors 1002 and 1003, which were sampled in a comparable way. The small livestock is better represented at Adaïma in the assemblage from sector 1001 because of the finer sampling technique. The ratios seen at El Abadiya 2 also are close to the ones published previously for the slightly later Naqada I settlement at HK29 (McArdle 1992). A different pattern is seen, however, at HK11 (Naqada IC to IIB, thus contemporary with HK29) and the later and more specialised site of HK29A (Naqada IIB-D) (McArdle 1992), where ovicaprines are the best represented animals, despite the fact that all loci at Hierakonpolis were sampled in a similar manner using quarter-inch (6 mm) sieves. Analysis of new material from those sites (and partial re-analysis of the older material) shows that cattle slightly outnumber ovicaprines at HK29A, and that both taxa are present in more or less equal proportions at HK11 (Linseele & Van Neer, in preparation). It thus appears that the relative importance of pig, cattle and ovicaprines was broadly similar in all Predynastic permanent settlements of Upper Egypt. The only possible trend is a slight decrease in cattle and a concomitant slight increase in ovicaprines when comparing Naqada I to later Predynastic sites. There

is no evidence for the trend described by Hassan (1984b) who states that in the Naqada region a definite and dramatic change occurred in the ratio of sheep/goats to cattle from the lower levels to the younger levels. The number of observations should be increased in order to further substantiate the slight decrease in cattle at the Upper Egyptian sites mentioned above over time. It is unclear if this possible trend is related to drier climatic conditions in the later Predynastic, or if the phenomenon of overgrazing favoured the keeping of ovicaprines with time. Possibly, the available pastures in the floodplain diminished over time as more land was brought under cultivation (*cf.* Hassan 1984a: 62), in which case small livestock herding may have been a more favourable strategy than cattle keeping.

11. Conclusions

Due to the very restricted area of excavation at El Abadiya 2, there has been little data gathered in relation to settlement structures. A buried pot and a hearth suggest that we excavated part of a habitation area, which had been in use for several (?) centuries. Unfortunately, the amount of sedimentation cannot yet be related to a specific duration of time, but we presume that it took some time before 50 cm of human refuse material accumulated. We have to take into account that compaction also occurred and that aeolian erosion has taken away some of the deposits, which originally were much thicker. At the end of the occupation period, this prehistoric midden covered an area of nearly 1860 m^2. The excavation proved that it is dangerous to make too strict a stratigraphical interpretation of the archaeological material. Post-depositional processes have been and are still very destructive for the stratigraphy.

The amount of archaeological material recovered is impressive; however, no "beautiful" artefacts were found, suggesting that the inhabitants were members of the average farming population of Egypt.

The ceramics confirm that the area was a habitation area where Rough ware, rare in the cemeteries, was prevalent. The best comparisons to the ceramics from El Abadiya 2 are to be found among the ceramics from the Naqada IA-IB period, especially from the nearby Khattara sites. The crushed pottery temper fabric is particularly important in this respect because its presence has only been attested in the Khattara region. This relative date is corroborated by the lithic technology and tool typology.

The flaking techniques applied at El Abadiya 2 are similar to those that were in use at the Badarian site of Mahgar Dendara 2 and at Naqada I sites. Flaking proceeded using a hard hammer technology, producing mainly flakes from cores, mostly with a single platform. Blades are rare. This is an opportunistic approach that has produced huge amounts of debris, more than 21,000 pieces from a surface area of less than 23 m^2. Flaking was clearly an important activity at the site.

When it comes to tools, the differences between the Badarian and the El Abadiya 2 site are clear. Tool types that are among the most important at El Abadiya 2, such as burins, end-scrapers and axes, are significantly less important at Mahgar Dendara 2. At the Badarian sites, however, typical bifacial axes, which are very characteristic at our site, were already present. The numerous picks and large borers, characteristic for the Badarian, are absent, with one exception. In its totality, however, the flaking techniques seem to form a continuum from the Badarian. The typological composition is, however, fundamentally different, even though axes already make their appearance in the Badarian.

The differences with later Naqada sites are minor, and the composition of the different lithic assemblages suggests that all sites belong to a similar typo-chronological group. Such a conclusion is also in accordance with the ceramic typology. Taking into account all the data, we attribute the site to the Naqada IA-IB period.

The El Abadiya 2 fauna shows that the site was inhabited all year round and indicates that gazelle hunting was still an important activity compared to later Predynastic sites. Another possible diachronic trend is a slight decrease in cattle and a concomitant increase in sheep/goat that may be related to overgrazing or drier climatic conditions in the later Predynastic. Among the domestic animals of El Abadiya 2, cattle was the major provider of meat, followed by ovicaprines and pig. Fishing was frequently practised, whereas fowling and mollusc collecting were less important.

As only a relatively small area (barely 1.3%) of the prehistoric settlement refuse area has been excavated and sampled, it is evident that the archaeobotanical record of El Abadiya 2 can only give a limited impression of ancient plant use (Cappers *et al.* this volume). The fact that cereals outnumber pulses and other economic plants indicates, however, that cereals must have played an important role in the food economy. Based on the number of rachis nodes, it is suggested that more emmer than barley was cultivated.

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